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THE BRICKBVILDER

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THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF ARCHITECTURE IN MATERIALS OF CLAY.

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THE BRITISH FIRE PREVENTION COMMITTEE.

IN our editorial of last month regarding the lessons of the fire in the Home Life Building, New York, we referred to the value of stern experience of this sort in teaching us how to overcome difficulties. We have just received another evidence of the manner in which a great calamity may become a means of very tangible and permanent good. Our readers will remember the fire which occurred in the Cripplegate district of London in November of 1897, one of the most disastrous conflagrations which has visited the British metropolis for several generations. As a direct result of this fire an organization has been effected of those who are interested in fireproofing methods and constructions, the organization taking the name of the British Fire Prevention Committee. It counts among its membership some five hundred architects, surveyors, engineers, municipal officers, and others directly or indirectly interested in fire prevention, among whom are practically all of the leading members of the professions named. It has offices, wherein is a library including files of some fifty technical journals from all parts of the world, and the regulations and building acts of all countries. The founder was Mr. Edwin O. Sachs, the well-known architect, and the objects of the committee are defined as follows: —

To direct attention to the urgent need for increased protection of life and property from fire by the adoption of *preventive* measures.

To use its influence in every direction towards minimizing the *possibilities* and dangers of fire.

To undertake such independent investigations and tests of materials, methods, and appliances as may be considered advisable.

In order to meet these objects a testing station has been established and a series of tests begun to obtain data as to the exact fire resistance of the various materials, systems of construction, or appliances used in building practise. The circular announcing the organization of this committee throws in the statement that the few independent tests made in the United States have so far been of only minor importance. We do not quite agree with that statement. On the contrary, it is possible to cite a very long series of most admirable tests which have been made in our principal cities with these distinct objects in view, and in fact we believe that the amount of exact knowledge of fire-resisting materials is quite as abundant in this country as anywhere else in the world. Still there is plenty of room for more. The objects of this Fire Prevention Committee are most admirable and it would be a very excellent idea to copy the scheme right among us. Though our tests have been well conducted and have demonstrated certain facts, they do have one serious drawback, namely, that with very few exceptions they have been principally under the direction of parties who were interested in proving the capacity of their special products. If it were possible to organize here a committee entirely distinct from any manufacturers' combinations, whose sole object would be to make a rigid, impartial investigation, and not only begin such investigation, but keep it up periodically, as is the evident intention of the British committee, the resulting good to our profession and to methods of proper construction would be almost incalculable. The British architects go about things more deliberately than we do. They do not have the rush and dash which seems to be a necessary concomitant of our work, and as a result thereof we get a great deal more done, but we slop over more easily, and are inclined to adopt systems of construction before they have been thoroughly tested. This British committee has our most hearty approval, and we shall await with a great deal of interest the results of these tests. We can only regret that a similar movement might not be started right off here in this country.

THE series of articles by Mr. Russell Sturgis, of which the second instalment appears with this issue of THE BRICKBUILDER, touches some new notes on the subject of brick and tile work for interior finish. Mr. Sturgis emphasizes one point which we have repeatedly urged in these columns, namely, that decorative tile and terra-cotta can be made as dainty and graceful in design and as purely artistic as is possible with any other material. Indeed, some of the prettiest and most graceful effects are obtained by the proper treatment of burnt clay. The public that pays for the buildings is so inclined to associate a certain rudeness of finish and coarseness of effect with enameled terra-cottas and tiles, and it is so seldom that the proper spirit is applied to this sort of work, that it is not always understood how readily a thoroughly decorative and at the same time appropriate treatment can be adopted in the designing of terra-cotta work. Mr. Sturgis's statement that it is always well to go back to the Orient for suggestions for the best ways of using tiles is worthy of careful consideration. Among what we call the civilized nations of the world, the decorative sense is acquired, rather than *sui generis*. It is the Orientals, especially the Persians and the Hindoos, who have that innate sense of color which has found expression in enameled terra-cottas and tile work of a kind which we can only imitate. We certainly are hardly likely to produce them from our own resources in this generation.

But, as Mr. Sturgis's article so aptly shows, there are lessons to be learned from the tile work of many other countries. We are so hampered by commercial considerations, and are so inclined to limit our choice to what the market ordinarily affords, that our comparisons are often limited to the product of the terra-cotta companies, and we forget the wide range of possibilities which the experience of the past has developed in the terra-cotta and tile industries. The difference between the work of North Germany, the Saxon china, and the fairy-like enamels of Persia, shows a range of possibilities of which we ought to be more ready to avail ourselves. There is surely nothing coarse or unworthy of high effort about the Delft chinas, and the Spanish islands of the Mediterranean show a species of tile which in a decorative sense is unique. We need not limit ourselves to the pages of a trade catalogue in order to find a high expression of art in terra-cotta, and Mr. Sturgis's line of argument is one which ought to open our eyes most effectually to the possibilities of this most fascinating material.

BOSTON has not kept up with the procession in the matter of architectural exhibitions. Indeed, there have been only two such in the past that were in any sense more than purely local in their character. In the fostering of the allied arts, however, a fine beginning was made two years ago by the exhibition of the Society of Arts and Crafts which was held at Copley Hall, under the direction of a carefully selected committee, including architects, artists, and craftsmen, and with so much success that it is to be repeated this year. The Society of Arts and Crafts hopes to bring designers and craftsmen into mutually helpful relations and to encourage workmen to execute designs of their own. It endeavors to stimulate in workmen an appreciation of the dignity and value of good design, to counteract the popular impatience of law and form and the desire for over-ornamentation and specious originality. The exhibition is to be held in April, and New England craftsmanship in great diversity will be shown, including metal work, jewelry, cabinet work, modeling and carving, pottery and glass work, stained glass and decorations, illustrations, printing, bookbinding, engraving, and artistic photography, textiles, embroidery and leather work, designs for carpets, wall papers, etc. The field is certainly a large one, and there is plenty of opportunity for a display of a quality which ought to have a very decided influence upon the arts and crafts.

PERSONAL, CLUB, AND SUNDRY NEWS ITEMS.

FRANK ELWOOD BROWN, formerly of Brown & Berger, architects, New Haven, Conn., has opened an office at 61 Orange Street, New Haven.

EDGAR B. FOX, architect, Columbus, Ohio, has withdrawn from the firm of C. A. Stribling & Co., and opened an office at 85 North High Street.

JAMES S. A. MERCER, architect, has opened an office at 1300 Broadway, New York City, for the purpose of establishing a practise as a contractor's quantity surveyor.

ROCKWELL M. MILLIGAN, formerly chief draughtsman in the building department of the Board of Education of the city of St. Louis, has opened an office for the practise of architecture in Suite 1103, Chemical Building, St. Louis, Mo.

GEORGE L. HEINS, of Heins & La Farge, New York City, has been appointed State Capitol Commissioner of New York to succeed Isaac G. Perry. The position calls for supervision of all State buildings, including hospitals, armories, reformatories, etc.

THE third competition for the John Stewardson Memorial Scholarship in architecture is announced. The scholarship is for a term of one year to be spent in travel and study in Europe. The income is $1,000.

THERE is a bill before the legislature of California which, if it becomes a law, will require all architects of the State to take out a license at an initial cost of twenty-five dollars and an annual cost of five dollars thereafter.

RECENT happenings at the Chicago Architectural Club: Mr. Louis J. Sullivan addressed the club on Monday evening, January 23, on "The Principles of Architectural Design." Mr. Lorado Taft addressed the club on Monday evening, February 6; the subject was "A Tramp Through Normandy and Brittany," illustrated with lantern slides.

THE New Jersey Society of Architects at their annual meeting elected the following officers for the ensuing year: president, Paul G. Botticher, Newark, N. J.; first vice-president, James H. Lindsley, Newark, N. J.; second vice-president, Robert C. Dixon, Jr., township of Union, N. J.; secretary and treasurer, George W. Von Arx, Jersey City, N. J. Trustees for three years: Albert Beyer, Hoboken, N. J., and Henry C. Klemm, Newark, N. J.

THE St. Louis Architectural Club has decided to hold an exhibition of architectural drawings, sculpture, etc., at the Museum of Fine Arts, from April 26 to May 2, inclusive. This being the second attempt of the club to hold an exhibition, every one is striving to make it a success. The club is doing more good work than at any previous time. A goodly number of drawings are submitted in the monthly problems. The club has lost one of its most valued members in Mr. B. H. Brown, who died on January 30. Mr. Brown has been for the past few years the superintendent of construction on the new City Hall.

THE thirteenth annual convention of the National Brick Manufacturers' Association was held at Columbus, Ohio, February 7, 8, 9, and 10. The papers read before the convention were of unusual interest, and the discussions which followed showed the keen interest that is taken by our burnt-clay manufacturers in the scientific and practical questions which their business presents. The following officers were elected for the ensuing year: president, W. D. Richardson, Shawnee, Ohio; first vice-president, F. B. McAvoy, Philadelphia, Pa.; second vice-president, W. H. Hoagland, Cayuga, Ind.; third vice-president, W. G. Titcomb, Providence, R. I.; secretary, T. A. Randall, Indianapolis, Ind.; treasurer, J. W. Sibley, Coaldale, Ala.

A BILL to abolish the New York City Building Commission, recently appointed by the Municipal Assembly, and to repeal the Building Code adopted by it, was introduced in the New York Legislature on February 6. A second bill was also introduced, which provides that a new commission consisting of eleven members shall be appointed by the governor, as follows: a member of the Board of Buildings; chief of the fire department; one representative of the health department, one member of the Tenement House Commission, who shall be an architect; one representative of the Board of Fire Underwriters; one civil engineer, to be chosen from a list of three names to be submitted to the governor by the American Society of Civil Engineers; three architects, to be chosen from a list of nine names to be submitted to the governor by the New York Chapter of the American Institute of Architects; one practical builder of at least five years' experience in the construction of modern fire-proof buildings; and one attorney and counselor at law who has been admitted to practise in the State of New York for at least five years. The Commission is to report to the legislature, not later than Jan. 15, 1900, a code of building laws for New York City.

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THE index to this volume, which is the first index that has been published in connection with THE BRICKBUILDER, will be mailed with the March number.

League and T Square Club Exhibitions.

ONE of our best friends, who, by the way, is certainly in a position to know whereof he speaks, declares that after a visit to New York he always feels as if he had been living on champagne cocktails for a week. Our personal experience of a diet of that kind is not of a nature to serve as a guide, but certainly one can hardly visit New York, see the work which has recently been going on, and then take in the League Exhibition, without the architectural pulse being quickened to a degree which suggests the most vivifying influence, while the extent to which the New York architects seem to have the opportunity to lavish money upon the erection of large, magnificent buildings makes one feel that, after all, Boston is only in the provinces, and Philadelphia a mere village of a million souls. To be sure there are compensations, and we return to Boston or Philadelphia with quite as much love for our native cities, though fully appreciating the tremendous opportunities which the New York architects seem to be enjoying just at present. The Fourteenth Annual Exhibition of the Architectural League is in some respects one of the best that has been held. It is essentially an exhibition of New York architecture. Very little has come from outside of that city; even Philadelphia sent but a scant quota, and of the New York architects themselves some of the best names are not represented. But withal the exhibition has so much of interest, and the promise it shows of the kind and the extent of work to which the New York architects are looking forward is so large, that a study of the drawings is very inspiring. The catalogue, which has come to be apparently so essential a feature of all these exhibitions, gives only a slight idea of the kind of work which is really exhibited. Modesty would certainly be lost in an exhibition of this sort, and mere size seems to have been considered in preparation of the drawings, for there is one tremendous sheet measuring 20 ft. long and 9 ft. high, a ¾ in. scale drawing of the proposed central pavilion of the Metropolitan Museum, which quite throws into the shade any drawing on a smaller scale or less pretentious in area. And yet, going over the exhibition a second time does not reveal much real greatness in the designs, and one has a flavor of disappointment that where there is so much that is good there should not be, with so great elaboration of architectual drawing, more truly monumental pieces of work. The New York architects are manifestly lacking neither in imagination nor in facility of expression, but elaboration does not necessarily constitute good architecture. Any one can pile a profusion of details on a drawing; indeed, as one of our prominent architects once remarked, "What do we buy books for anyway?" but the fundamental conception of idea in mass, the monumental feeling, which should be the basis of all architecture, is not as conspicuously displayed in the designs exhibited here as one might wish. There is plenty of froth and foamy billows, but not the suggestion of a steady, increasing tide of good, solid growth which we should hope to see. It is as if our architects, having ceased to be original and bad, had reached the second stage, where mere copying of detail masked absence of pure conception. Fergusson, in his "History of Architecture," used to sarcastically remark that the American idea of planning was to cut out slips of paper the sizes of the desired rooms and somehow fit them together like a gem puzzle. It might now almost be said of the present New York fashion of design, that the *modus operandi* is to accept almost any general mass or arrangement, and by liberal borrowing from Cæsar Daly and the *projet médaillé*, paste it all over with a swirl of ornament, and if perchance some clean wall spaces are left, make up for the neglect by piling it on a little thicker somewhere else. There is one consolation, however. Like the present abominable styles of woman's dress, this is a passing fashion, and when our architects have recovered from our *fin de siècle* madness the profession will at least find itself with a greater facility in the use of our architectural tools.

But this is not brick architecture. Indeed, it is hard to separate out all the designs which might have been executed in brick, for the reason that the color often masks the real material in the drawings, but there is hardly a design exhibited at the League which could not be studied to advantage by any one who would even wish to limit his architecture to expression in burnt clay. Cope & Stewardson, one of the few outsiders, send in a very interesting drawing of the University of Pennsylvania Law School. They also exhibit an unusually interesting drawing of the central pavilion of the dormitories for the same institution, a Tudor design in brick and stone, with a big archway in the ground floor flanked by oriel windows and side towers, the whole very successfully pulled together and shown by a very clever drawing.

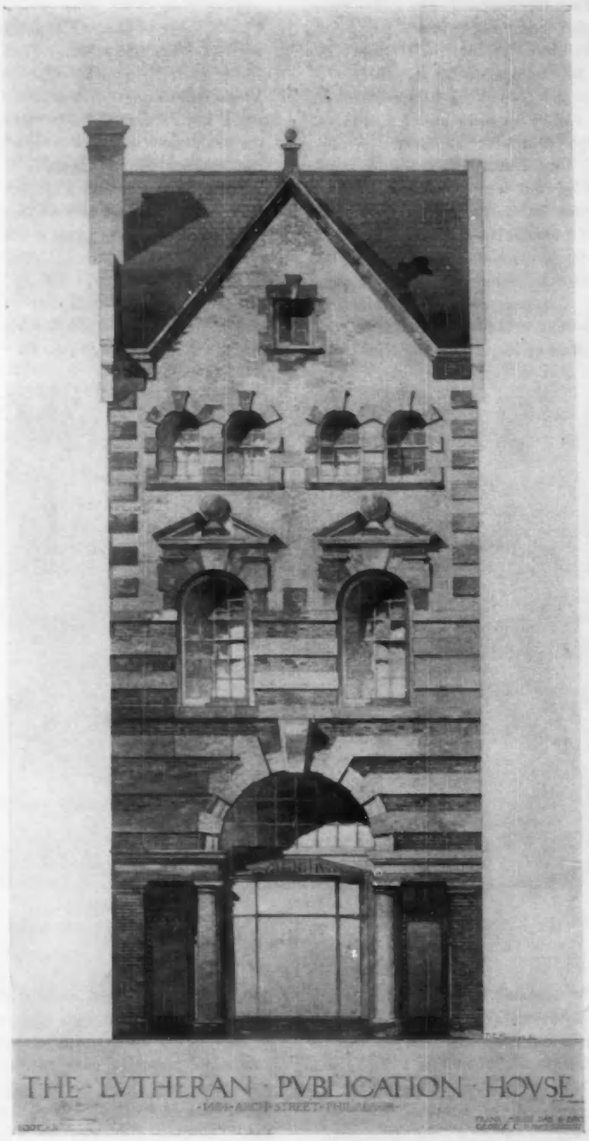
RESIDENCE OF JOHN C. SIMS, ESQ.
Cope & Stewardson, Architects.
(By permission of the T Square Club.)

On the opposite wall are several of the charming post-offices for which the government architect office is indebted to Mr. J. K. Taylor, who is an artist as well as a good architect, and shows it in the way he treats the problem of a post-office in small towns, a problem which, by the way, has seldom been treated properly, though offering great possibilities. There are also, as would naturally be expected, several designs exhibited for residences in the Ecole des Beaux Arts style, which seems to have fastened itself so thoroughly upon the affections of New Yorkers, the red brick and stone trimming sort of design, which is so familiar to the Parisians, and which we are beginning to see dotted around New York. Janes & Leo have a pleasing study for a house on upper Fifth Avenue, and close by is shown a very clever and knowing pencil sketch, daintily colored, for a city house, designed by Palmer & Hornbostel. Mr. T. Henry Randall sends some studies for a residence at Tuxedo Park, which seem in character quite a charming innovation as compared with some of the earlier creations of that exclusive suburb, — a design in the Tudor style, to be carried out in brick and terra-cotta, facing on a broad, liberally proportioned terrace giving upon a formal garden, shown by a drawing which is well studied, appropriate, and presented in a very happy manner. Ingle & Almirall exhibit a drawing for the design of the Binghamton Savings Bank which is excellent of its kind, though it is so much akin to the motives which seem to have been appropriated for private residences that it would hardly suggest a bank. Haydel &

Shepard contribute, in the fashionable line, an elevation of an elaborate residence in buff brick and white stone ornamented in the accepted French style.

Of the public work, perhaps one of the most notable contributions is made by the competitive designs for the Jersey City Public Library, one of the numerous public buildings in which brick has been successfully applied. C. W. & A. A. Stoughton show a very well studied design in red brick and stone, and the designs for the same building by Mr. Freedlander, Benson & Brockway, Lord, Hewlett & Hull, and Stone, Palmer & Hornbostel, as well as the premiated design by Brite & Bacon, show a proposed use of brick, and the problem on the whole has been very satisfactorily worked out by all of them. The United States Immigrant Station, at Ellis Island, New York, by Boring & Tilden, is represented by both an elaborate rendered drawing and a large plaster model. This building is apparently in a buff brick of strong color, with white stone or terra-cotta trimmings. Our readers doubtless remember the procedure by which the architects for this building were selected as the result of a public competition, and certainly this exhibition would seem to justify in the fullest measure the choice of the jury. Then, on a smaller scale, the Grace Hospital Nurses' Home, by Nettleton & Kahn, is a well-balanced design in Tudor style, indicating red brick and white stone. The Plainfield Library, by Tracy & Magonigle, shows a scheme of pale brick and white trimmings, chaste, in thoroughly good design, and excellent in color, illustrating how well brick can be adapted to monumental purposes if properly designed.

Mr. Bruce Price exhibits a perspective of a design for the Hotel Brunswick, rendered by Hughson Hawley, a combination of red brick, white trimmings, a rainy day, a crowd of people with umbrellas watching a procession, and a thunderous, cloudy sky, a drawing which makes one feel that both the architect and the draughtsman must have had lots of fun over it, for, aside from the picturesque treatment, the design builds up in a rich, opulent, New York fashion, with a profusion of really admirable motives and carefully studied details. The treatment of the first story seems to be especially good. Mr. Price also sends a design for the Oikopolis, also rendered by Hughson Hawley, a huge structure, which might be an office building or a modern hotel, but on the face of it it is chiefly an interesting composition. In this building brick is used for a central motive, in the emphatic, straightforward manner which Mr. Price knows so well how to adapt to the exigencies of a large design.



THE LUTHERAN PUBLICATION HOUSE, 1424 ARCH STREET, PHILADELPHIA, PA.

Frank Miles Day & Bro. and George C. Baum, Associate Architects.
(By permission of the T Square Club.)

The *pièce de resistance* of the exhibition, from a burnt clay standpoint, is a store front, which occupies the greater portion of one end of the room, being not merely a full-size model, but the actual construction of a two-story store building, which has been erected by the Perth Amboy Company, chiefly as an experiment to determine the possibilities of enameled colored terra-cotta. The photograph of the building itself, which we publish herewith, will show the character of the design. The wall surface, of which there is very little, is a light buff in tone. The window finish and the balusters of the cornice are white, or as near so as we can get in terra-cotta. The pedestal and horizontal moldings generally are strong gray buff, the pilasters of the same, but colored a dull red in the hollows of the flutes. The frieze of the cornice has a green ground with running ornament in white picked out with a little red. In the egg-and-dart course of the cornice, the eggs are red, the darts black, and the fillets green. The pilaster bases and foliage of the caps are green with a dash of white in the latter. Green also appears in the ornamentation of the panels under the windows and in the pedestal course. The general effect is all pale buff, red, and green, the buff being varied only slightly by the use of white. The red is a dull Indian red, and the green is a strong though not a bright emerald. The terra-cotta is glazed, with the surface cut down to a smooth, velvety appearance by the use of sand-blast. The mortar is in general colored to match the adjoining terra-cotta. Without undertaking to discuss the architectural merits of the design, as an attempt in color, it is a brave endeavor deserving every encouragement, and the general effect is soft and pleasant. It is a kind of success which, while by no means perfect and leaving much to be desired both in the quality of the colors and in the relative application thereof to the architecture, shows, or at least indicates, the possibilities of this kind of treatment. The architecture is of design to which color can be applied with perfect propriety, when a larger or more pretentious scheme might be simply ruined or frittered thereby. It used to be a maxim of the school, that color and form

in decoration should not be used together. This is a mistake which we are growing out of slowly, and the dogma was probably formulated from the timidity or crudity into which one can so easily slip. Certainly this essay of the Perth Amboy Company shows that color and form can be allied most successfully.

A noticeable feature of the exhibition is the extent to which models have been shown: models not merely of fragments of ornament, but of all schemes of development for houses and their surroundings. There are no less than thirty serious models of this sort forming a part of the exhibition, and they not only help out the interest very materially, but they show how thoroughly our architects are studying the problems which are presented to them.

T SQUARE CLUB CATALOGUE.

Of recent years the illustrated catalogue has come to be a very prominent feature of our architectural life. It is by no means sure, however, that the illustrated catalogue, *per se*, is a highly desirable factor, and the hope has often been expressed that the day may come when, if catalogues must be, and they must be illustrated, it will not be necessary to levy contributions on the builders and manufacturers to pay the expenses thereof. There is an ethical question involved therein which is susceptible of very extended discussion, and there is a sort of feeling on the part of a good many architects that the exhibition ought to pay its own bills rather than call upon the kindness of the manufacturers. But taking things as they are rather than as they might be, the catalogue of the T Square Club exhibition of Philadelphia for this year is certainly in the lead of the procession. It is well gotten up, the illustrations are admirably selected, and it forms a sort of an annual round-up which has interest not only for Philadelphia but for the country and the profession at large. The Quaker City has been passing through an architectural development in which the T Square Club has been by no means an inconsiderable factor, and with its customary enterprise the club this year has in its catalogue inaugurated a departure in the shape of an introduction which deals with matters architectural in a way that would perhaps be possible only in a publication of this sort. The introduction forms a review, having as its well-defined purpose the encouragement of honest, unaffected architecture. It begins with a very clear summary of the principal architectural events of the year 1898 which are of moment to Philadelphia, and it would be difficult to overestimate the good that this summary of the municipal work might accomplish. The emphatic protest against the condition of the public building in Philadelphia, upon which millions have been sunk and upon which millions must yet be expended before it will be anywhere near complete, ought not to pass unheeded. It is an old story to all of us, and the characterization of the kind of work which every municipality seems to have to content itself with is a standing reproach to our methods of civic architecture. This particular building, however, is no worse than the Pennsylvania State Capitol, a design for which was accepted for a structure, the cost of which was to be something over $300,000, which is still so incomplete that the building commissioners now have the audacity to ask for an approriation of $3,000,000 to complete it.

The introduction of the catalogue also contains an interesting symposium upon the very trite subject, "An Unaffected School of

GARDEN AND DORMITORIES FOR THE UNION LEAGUE CLUB, PHILADELPHIA.
Mead & Keen, Architects.

(By permission of the T Square Club.)

Modern Architecture in America — Will it Come?" with replies to the question from a number of the most prominent architects and educators throughout the country. The symposium itself is a good presentation of the architectural bent of those who took part in it, and perhaps unconsciously there is more to be read between the lines than occurs in the actual words, for as the contributors are all leading men, the discussion presents some phases which perhaps were not intended. The forces are pretty evenly divided now as to what constitutes good architecture. There are those who feel that the sun rises in France and stays there, and that only faint reflections of glory reach our shores. There are others equally sincere who claim that "It is not a thinkable proposition that from a people democratic and free, self-reliant, resourceful, possessed of their own bodies, possessed of their own souls, self-centered, deep of aspiration, there shall not some day suspire as an exhalation an architectural art germane to those gifts, responsive to that throb, eloquently voicing every form, every aspect of what is genuine in our national life." There is a good deal of the holier-than-thou spirit in some of the replies which were sent in to this question, but there is also a good deal of earnest, straightforward, logical discussion of the subject which will do any one good to read. Mr. D. H. Burnham, in his terse, straightforward manner, summarizes in a very few words one view of the subject by saying: "There is little in the details used on the exterior of our buildings that is exclusively American; but architecture is not detail: it is the whole expression of a building, and in their whole expression there are American buildings that are fresh and original, and some of them are good from an artistic standpoint." Mr. John M. Carrere very aptly suggests that the development of an unaffected school of modern architecture in America is the sort of thing which is usually looked back upon and not forward to, and it is truly to be doubted whether we are really able to judge of what is going on about us. We may be like Molière's *Bourgeois Gentilhomme* and be talking most excellent architectural grammar all the time without knowing it. Indeed, perhaps this is what Professor Ware has in mind when he advises the T Square Club not to worry. "The practise of architecture in this country seems to me to be, in the main, in a perfectly natural and wholesome condition, full of health and vigor, growing in grace and stature and in favor with gods and men, if there be any deities which concern themselves with its destinies. Speculative meddling can only do mischief." Mr. Cass Gilbert voices much the same thought when he says that if the architecture of our country is beautiful and appropriate the question of originality will take care of itself. All this discussion certainly tends to keep alive the spirit of investigation, the questioning attitude, the progressive thought, which must in the end conduce to the kind of architecture of which we should all be proud, and the T Square Club has drawn about this trite subject a very interesting expression of opinion, presented in such a way that it will be read and pondered by all those who are directly interested in good architecture.

STORE FRONT, OF ENAMELED COLORED TERRA-COTTA; FULL-SIZE MODEL SHOWN AT THE LEAGUE EXHIBIT.
Executed by the Perth Amboy Terra-Cotta Company.

Another admirable feature of the introduction is a list of the names of those who have gained recognition in consequence of individual proficiency in the highest institutions at home and abroad, including the American graduates in architecture from the Ecole des Beaux Arts and the holders of the various traveling scholarships. It is interesting to note in this list that there are only twelve American graduates from the French school, three in 1895, three in 1897, and six in 1898. The work of these graduates has not yet made itself felt in the architecture of our country, but there are many others owing their training to the Ecole who are striving to make us all believe that therein lies our salvation. If, however, the illustrations which the catalogue contains of the accepted designs for the Electricity Building and for the main entrance to the Paris International Exposition of 1900 are to be taken as typifying the most recent expression of the possibilities of the Ecole des Beaux Arts treatment, it can only be hoped that such influences may be rendered innocuous by disinfection in crossing the Atlantic, for no wilder, ghastlier scheme of architecture, no more truly incongruous, irrational constructive nightmare could be evolved than the design of the Electricity Building, while the main entrance is like nothing in the heavens above nor the earth below. The value of the Ecole des Beaux Arts training is beyond question. The high quality of the work which is at times turned out by the French architects is deserving of the sincerest form of admiration, but if the tendencies of the Ecole are to degenerate at the rate they seem to have been traveling during the past few years, we shall not need to go to Paris to find our distinctive American inspirations.

All this need not imply any censure of the T Square Club or its catalogue. The one is a worthy representative of the excellent spirit and organization of the other, and both are eminently successful.

THE Chicago Architectural Club has announced its twelfth annual exhibition of works of architecture and the allied fine arts, to be held at the Art Institute, Chicago, from March 28 to April 16, 1899. This exhibition will include architectural drawings and sketches; projects for public and monumental work; interior decorations and furnishings; architectural and decorative glass, mosaic, and metal work; sculpture — architectural and decorative — models.

Bricks and Tiles for Interior Finishing. II.

BY RUSSELL STURGIS.

IN the first of these articles mention was made of the easy practicability of so using painted tiles as to give more than a mere pattern decoration to a wall. It was suggested that vertical bands of scroll ornament and the like could be used with an effect midway between strictly architectural designing and that of flat wall decoration. What are often called, by a very bold extension of the term's significance, candelabra may be carried much farther than is done in the Chinese examples cited above. Those who remember the front of the house in Paris situated on the Cours-la-Reine, and known as the house of Francis I., or those who remember its rather close study in the front of the Fine Arts Society's building in West 57th Street, New York, will remember the sculptured uprights, whose design is midway between that of an engaged column and that of an inverted torch. It is a motive not uncommon in French Renaissance architecture and not incapable of the finest inventions of that intelligent, vigorous, and most interesting style. Such quasi-architectural decoration seems eminently fitted for carrying out in terra-cotta, whether colored or uncolored, whether large or small in scale, whether in bold relief, as for large and high rooms, or in delicate half-seen projection, as if of Spanish tiles. That such motives of design are as workable in relief as they are in flat color will be readily granted by those who have seen the effective use of terra-cotta in the recent American exteriors. The pleading here is merely in favor of the freer use of such design as applied to interior decoration, where, of course, a less conservative method and a more ready trusting to one's own initiative may be looked for and may be safely condoned than in exterior compositions.

It is always well to go back to the Orient for the suggestions of the best ways of using tile, for it is in the Orient that such work has reached its higher development. Fig. 1 is a representation of a piece of wall decoration in the mosque at Damietta, in lower Egypt. The tiles of the absolutely plain dado are green; those of the *dessus de porte* are green above and blue with a yellow pattern below; those of the outermost architrave are orange with a red pattern; those of the lintel band with the Arabic letters are dark blue, the scrolls in yellow, the letters in white; those of the broad architrave with the leaf-shaped continuous pattern are bluish gray with dark blue bands outlining the member; those of the innermost vertical panel, which represents a door, a niche, a wall opening, what you please, are green with only the curious little spandrels at the top of a strong orange yellow. It will be noticed that the two inner members of this architectural composition are composed of tiles modeled in slight relief as well as decorated in color. All the rest of the design is very flat, and the very narrow fillet which surrounds the whole and runs along the top of the dado may be supposed to be flush or nearly flush with the plastering outside. Now, this way of adorning the interior face of any door opening or window opening with its setting and its appliances is the normal one. Whatever you call your outside architrave and however you may disguise its nature by make-believe construction, — by pilasters, by engaged columns, by a fronton and an entablature of no matter what importance at the top, — you still have it, the outside architrave and no more. The predilection of the present writer is strongly in favor of seeing things as they are, of refusing to disguise what is really a flat band intended chiefly for needed ornamentation under forms and under names borrowed from Greco-Roman architecture of a different destination and of a different class of work. Other critics, other designers, have a different notion and cannot dispense with the associations of the pilaster and what it carries. This is indifferent; the only essential point is that the outer band of the door piece or window piece be considered now from the point of view of the maker of decorative objects in baked clay. In one of the most interesting buildings connected with the Paris Exhibition, the Pavilion of the City of Paris, the outer doorways were designed on this principle and entirely of baked clay, so far as their surface decoration was concerned. Band within band the rows or orders of tiles succeeded one another, the whole being framed in an actual structure of light ironwork. If one may trust a recollection twenty years old, the outer band was of brown terra-cotta with pattern in relief, the separate tiles being at least 20 ins. square. With this, with only a slight border to separate the two, was a second band of tiles, also in slight relief, but these very highly decorated in color and thickly glazed so as to have considerable vitreous luster. There was no more affectation of architectural details, of pilasters or pillars, in this case than in the Cairene portal before us; but there was a great deal of relief, for the broad architraves of the Paris door were not flush with the wall which enclosed them one with another, but had here a splay, there a change of surface from a more projecting to a less projecting plane, and this play of shadow enhanced the portal-like character while it increased the chromatic effect of the whole. Within smaller limits similar variety of treatment is called for in our interiors as well. If one were to carry out an interior without many restrictions as to space occupied or expense incurred, he would probably demand that treatment of a door piece which would at once facilitate the use of the doorway considered as a means of exit and entrance, and also suggest its purpose in this way. The treatment of the windows in the same room as the door in question would almost inevitably be akin to the treatment of the doorway, though in the case of the windows the same reason for splayed or rounded corners of the jamb would not exist.

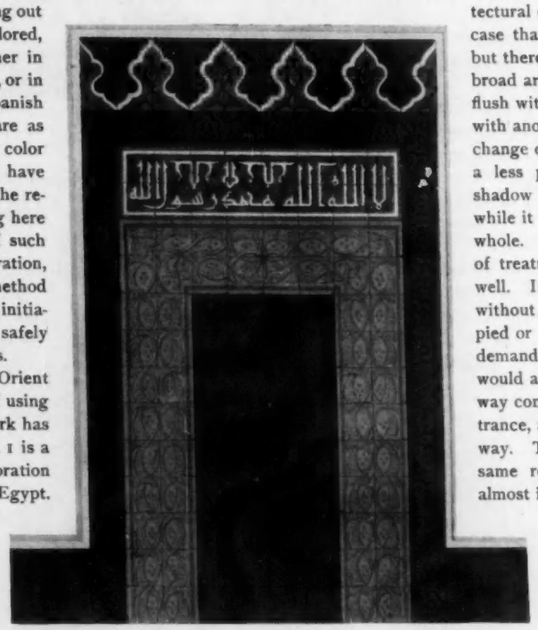


FIG. 1.

More formal architectural treatment may be given to the terra-cotta used in interior decoration, and this is made comparatively easy by the enterprise of some of the firms who are doing what they can to increase the familiarity of the public with the use of this inexpensive and convenient material. It should never be urged that any architect employ the patterns in stock except in so far as those patterns are of the very simplest character, mere bosses, nailheads, elements of moldings, and the like. Every designer worthy of the name will long for, and on occasion will insist upon, the privilege of designing his work afresh, even to the volutes of his Ionic capital; and yet it is manifest that the familiarity of the workmen in the factories with the forms, the dimensions, and the general character of the blocks needed in an architectural composition has done much, and may do much more, to cheapen such material and to expedite its use. When a room is to be treated with an order of pilasters raised upon a dado, a familiar device but one of which the designers and the public seem never to weary, it would be as easy to carry it out in baked clay as in any other material. It would also be much cheaper

FIG. 2.

than stone of any kind and much more valuable and permanent than in plaster or in wood. Moreover, there is nothing to prevent such an internal facing of a room from being built thoroughly well into the actual brick wall. The upper courses of the dado may be built with the wall itself, and that would be an ideal plan, while the pilasters above would be keyed or anchored into the wall at frequent intervals, and all this semi-structural decoration would be in place before the remainder of the wall surface, as any paint, any plaster, any textile fabrics, any leather, or any tapestry, should be applied.

At the same time it is more easily suggested by the nature of the material which we are considering that its parts should be rather small, its ornamentation varied and fantastic rather than formal, its use more nearly like the use of woodwork than that of the wall masses themselves. The little pilasters of the Renaissance properly so called, Italian of the fifteenth or French of the sixteenth century, with their non-regulated, unrestricted little friezes, capitals, and face moldings, are probably more in the way of the worker in baked clay than are the more academical designs of a later and less original school of designers. Fig. 2 shows this tendency toward the small and fantastic and the strictly decorative carried almost to an extreme. It represents a panel of sixteenth century German work, the original being in glazed and colored terra-cotta of great boldness of design and of relatively bold relief. The original may be seen by the curious in the well-known castle of Nuremberg, the favorite place of resort of all artistically minded travelers. It may be well, perhaps, to add for the information of those who might otherwise seek this panel and its fellows in wall friezes or dados, that this particular unit of decoration is taken from a stove, the work of the celebrated Hirsvogel. It seems even worth while to give the whole of the stove in a slight and sketchy fashion. It is so given in Fig. 3. Such a stove, standing 8 ft. high and glowing with color, enhanced in its effectiveness at once by its relief and the vitreous gloss of the surface, forms the chief decorative object in many an ancient German palace hall. Nowadays, that the inexpensive and certainly inadequate method of heating which this stove represents has been done away with by more complete and far more costly modern appliances, we can only look at the stove with longing; but its suggestiveness as a combined piece of pilaster work, niche work, scroll work, of decorated moldings, of free-and-easy, semi-classical treatment of details still exists and is still considerable. In connection with this the obvious utility of painted and molded tiles in our modern fire-proof construction is to be considered. The builders of the day, the owners of the day, the tenants of the day will not listen to omitting wood from their buildings, so great is the prejudice in America against any flooring, any door, any window sash that is not of the time-honored material. Instead of omitting the combustible from the building, they prefer to protect against the possible effects of its combustion the iron which forms the main structure of the edifice. If now, instead of filling up our floors to a solid mass, we were to desire to regain some of the ancient picturesqueness, something of the vigorous light and shade given by an open ceiling with its beams showing from the under side, what more natural than that we should do as the Greeks did in Phidias's time and put a shell of decorated terra-cotta around each separate beam? The whole ceiling — the whole top of the room — would then be cased in terra-cotta, glazed, richly painted and flat, or in relief, as might be desired, and all so put into place with tie joints and perfect continuity of surface that flame would be excluded and even excessive temperature kept out by the continuous jacket of non-conducting material. There is no room here to insist on some most astonishing results of recent experiment in which the temperature of the space within a brick pier has remained at an inconceivably low figure while a deliberately made fire raged without and around it. It is enough to remind our readers of what every architect well knows, that nothing is so good a protection for either wood or iron as a sufficiently thick and, above all things, perfectly continuous and

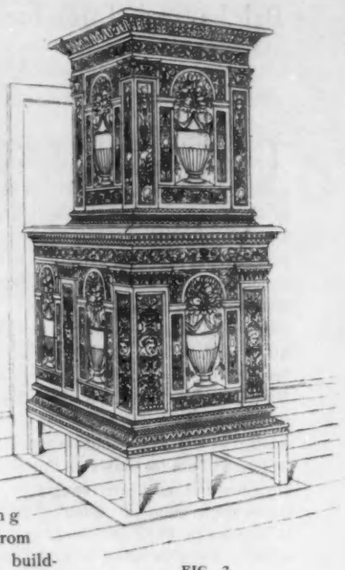


FIG. 3.

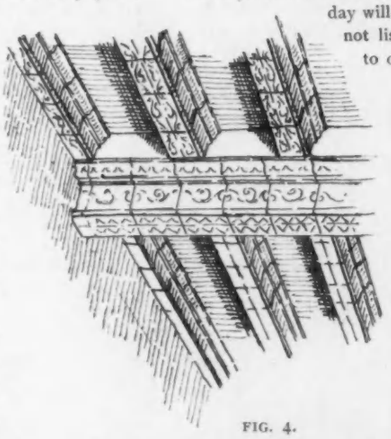


FIG. 4.

FIG. 5.

unbroken coating of earthenware with a certain amount of air space between this fire-proof shell and the material to be safeguarded.

FIG. 6.

Fig. 4 shows a study for such a ceiling freely adopted from a detail in a noble French chateau.

In these ways we may try to line our rooms with ceramic ware; and, in this connection, it will readily be seen how important is the consideration of sculpture, whether colored or without the use of polychromy. Fig. 5 is an instance of a chimney-piece built of brick of unglazed brown terra-cotta and of enameled terra-cotta, the whole combined in one design by Mr. Paul Sedille, of Paris. It is very far

FIG. 8.

from being an ideal composition. Some of the plain mantelpieces in an office building in New York, the design of Mr. George B. Post, in which a plain "commercial" terra-cotta mantel is attached to the front of the chimney breast built of dark red brick, are more effective in design than this one. But this one contains a vast amount of applied decoration, some of it good in itself, though none of it seems to be exactly called for by the design or to be in any strict sense of the word constructional or even very appropriate. The most valuable part of the whole composition is probably the placing in the jambs of the fireplace two figures modeled by Mr. André Allar. It will be generally felt, no doubt, that these figures are crowded on the one side by the open hearth, where glowing coals may be expected to lie and a bright blaze flash up for six months of the year, and on the other side by the projecting breast pieces against which they lean. They are too crowded; they will inevitably be broken by the servant who makes the fire; they are in the way of those persons who would gather round the fire, and in their verisimilitude of life form too much a part of the living group. At the same time, the whole of the composition is not without suggestion for those who would see at one and the same time free and realized sculpture, such as the men of our time are capable of producing, combined with architectural adornment of their interiors, and to see the whole of this varied effect produced in the material baked clay. A much better piece of sculpture, and a much more appropriate architectural setting, is that shown in Figs. 6 and 7, parts of the great doorway in the famous 100 ft. gallery (Galérie de 30 Metres) at the

FIG. 7.

exhibition of 1889. The architecture in itself is feeble enough, a forlorn little reminiscence of the weaker kind of Romanesque: but the use of its outlines as frames for the panels of sculpture is unobjectionable and the panels themselves are admirably fitted to their shape, size, and position. The little ceramists are at work: first, firing up and mixing clay; second, tempering and handling the clay and turning pots on the wheel; third, modeling more important pieces by hand and adjusting handles and sinking bas-reliefs; and so on to the last panel in Fig. 7, where they are at work on a mosaic, — small in scale, as it must be admitted. Such intelligent use of sculpture in relief is really the most obvious of all the ways of decorating our interiors in a thoroughly artistic and thoroughly modern manner. At the same time, a word of suggestion from very ancient times indeed is always in place when the ancient times are those of artistical Greece, and it is worth while to look at the terra-cotta tablets shown in Figs. 8 and 9 for their composition, — for their treatment of relief on a ground of the same color and for the admirable combination of figure sculpture with purely decorative forms which they show. The conventionalized winepress and vintage festival shown in Fig. 9 is of extraordinary interest to any sculptor who would learn the secret of making his art serve the purpose of the architectural designer. Our modern tendency is that the architect shall do nothing but build, and appropriate his ornamentation ready made; that the sculptor shall do nothing but model with sole reference to his sculpturesque conceptions and disregarding all possible application of it to a larger and heavier, a more constructional, piece of work. Six months' study of the terra-cottas in the Musée

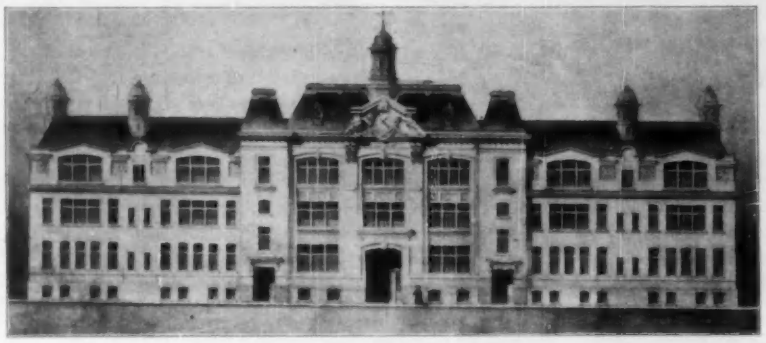
FIG. 9.

Campana, from which are taken these two friezes, would suffice to show those sculptors how they might be of some use to the architects. Some few of them have the instinct of decoration as well as the instinct of unapplied fine art of form, but not all have this gift by nature.

The American Schoolhouse. XV.

BY EDMUND M. WHEELWRIGHT.

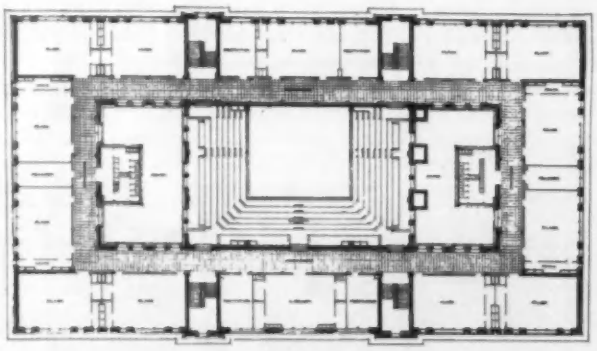
WE have in the Newark High School and the Springfield High School interesting examples of high schools with the interior lighted by courts, and with the assembly hall placed within, gaining its main light from the ceiling. The Newark school presents in its general features the better ordered plan of the two, but this may be observed without discrediting the architects of the Springfield school, who had originally designed a building with essentially the same arrangement as that shown in the Newark school, but who were not permitted to carry out their ideas by the commission in charge of the work. The Newark school, in a broad way, presents, therefore, a more satisfactory treatment of the high-school problem. It is interesting to note that in the Newark school the general arrangement of plan not only follows that of the continental schools, but the continental method of lighting the schoolrooms from one side only is followed, but apparently with the retention of the American width of schoolroom, 28 ft., which does not give adequate lighting. In the Springfield school the clothing is hung in alcoves adjoining the corridors from which the schoolrooms give, thus following the latest German method of clothing disposal, an arrangement which is not advisable. In the Newark school the cloak rooms are in the basement, following thus the method found in the latest American high schools.



NEWARK HIGH SCHOOL, NEWARK, N. J.
Howard & Cauldwell, Architects.

The Springfield school has several large schoolrooms, in this arrangement approximating to that found in the English schools and in our normal schools, and such as was and as still is the arrangement in our old-fashioned academies. This system was also maintained in the district schools of this country before the German method of graded schools supplanted the English system. The Newark school has apparently schoolrooms of like size to those in our graded grammar schools; the plan being in fact almost that of a grammar school, except that the wardrobes do not adjoin the schoolrooms, but, as noted above, are placed in the basement.

It is interesting to note the varying eclectic use of schoolhouse features derived from or analogous to examples to be found in other countries, an eclecticism probably to be ascribed in part to the varying ideas of the school authorities and in part to the preference of the architects. From whatever source they may come, the adoption of these varying features shows that our methods in high-school planning are not as rigid as they have become in our primary and grammar schools. This is fortunate, as



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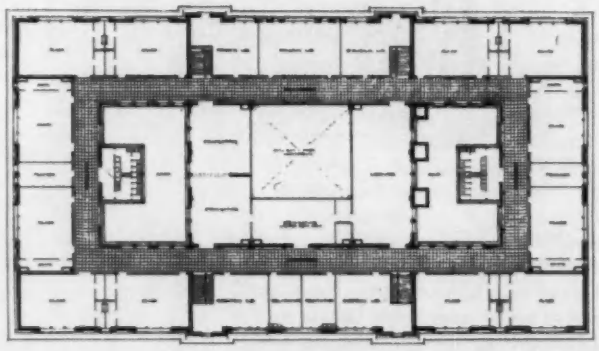

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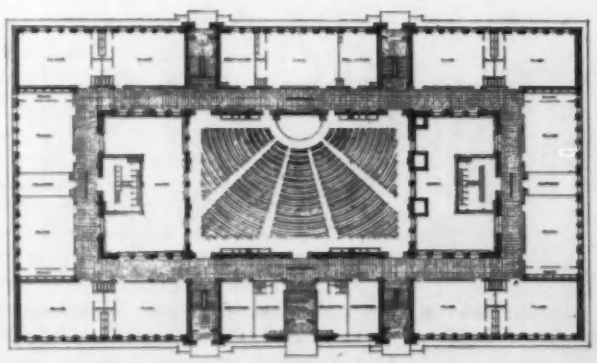

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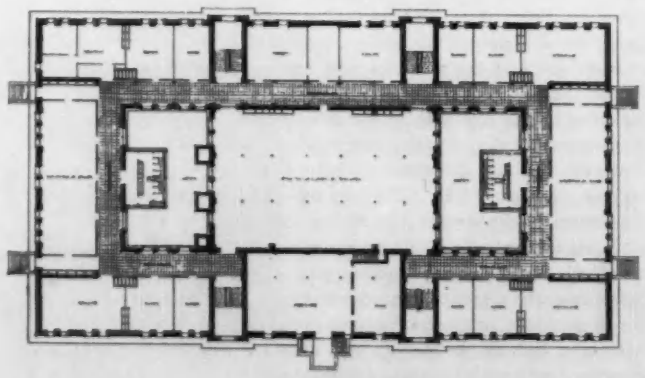


BASEMENT.

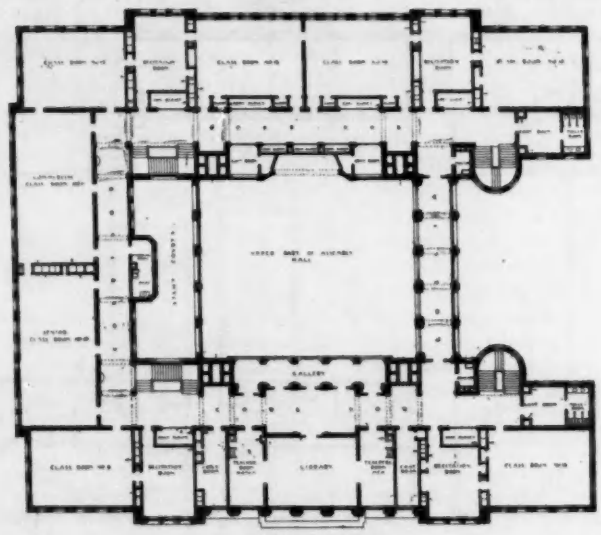
PLANS, NEWARK HIGH SCHOOL.

the high school, if we leave out of consideration the mechanic arts and the normal schools, is the highest of the schoolhouse types, and from the varying experiments in this type we may expect to derive the greatest advance in schoolhouse planning, especially in the manner of lighting. It is mainly in the high schools that the German method of excluding windows immediately in face of the teacher is seen, and it is from the adoption of this feature in the primary and grammar schools that the main future improvement in the planning of these graded schools will come; as associated with this change a less width should certainly be adopted for the class rooms in primary and grammar schoolhouses if they are to be properly lighted.

SPRINGFIELD HIGH SCHOOL, SPRINGFIELD, MASS.
Hartwell, Richardson & Driver, Architects.

The disadvantages of the undeveloped condition of high-school planning cannot be better illustrated than by the plans here presented of a high school in a city of the State of New York.

The achievements of the architects of this building in other lines of their profession make this failure in schoolhouse designing the more to be deplored. The practical requirements have been sacrificed for exterior effect in an



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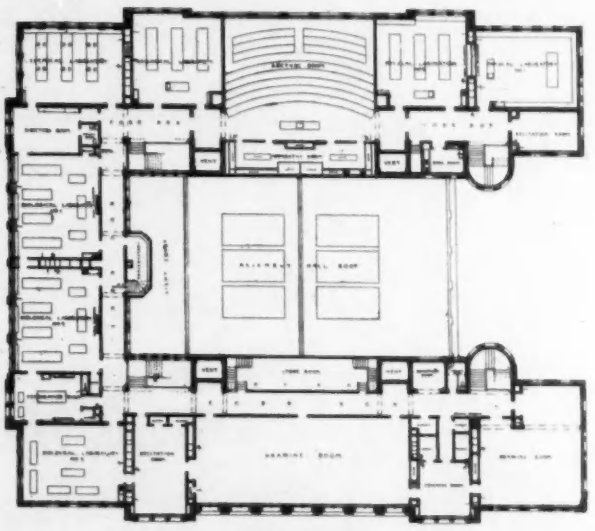

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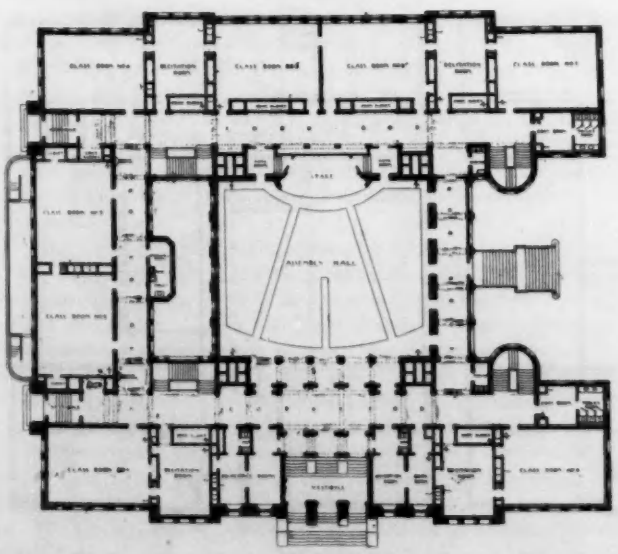

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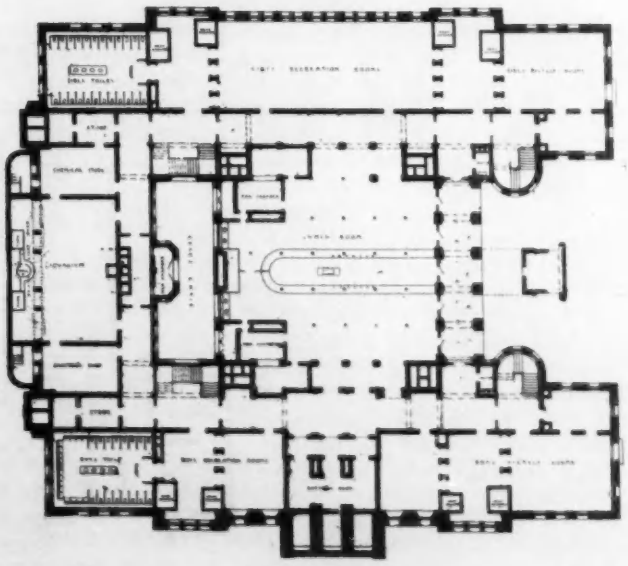


BASEMENT.

PLANS, SPRINGFIELD HIGH SCHOOL.

extraordinary manner when the general advancement of schoolhouse planning in this country during the past decade is considered. The

LATIN SCHOOL BUILDING, CAMBRIDGE, MASS.
Hartwell, Richardson & Driver, Architects.

design does not show one properly lighted schoolroom. Two of these schoolrooms, with windows inadequate for proper lighting even if on the outer wall, are shadowed their whole length by an arcade which has the sole function of supporting a balustraded platform on the second story. The distance between the outer walls of the schoolrooms and the outer face of the arcade which shadows them is fully 15 ft.

This schoolhouse is given a high pitched roof like that of a Louis XIV. chateau, which is apparently not utilized.

The designers of the Newark school have also constructed a Beaux Arts *projet*, but they have used the architectural forms which they have chosen in a satisfactory manner, albeit in seeking external effect they have been led to injure the light by the use of transom bars. They have also given some of the schoolrooms of the first floor less window surface than those immediately above them, a sacrifice of utility of purely academic origin, which is not justified even by any better external effect than would have been given if a more reasonable expression of the plan had been adopted.

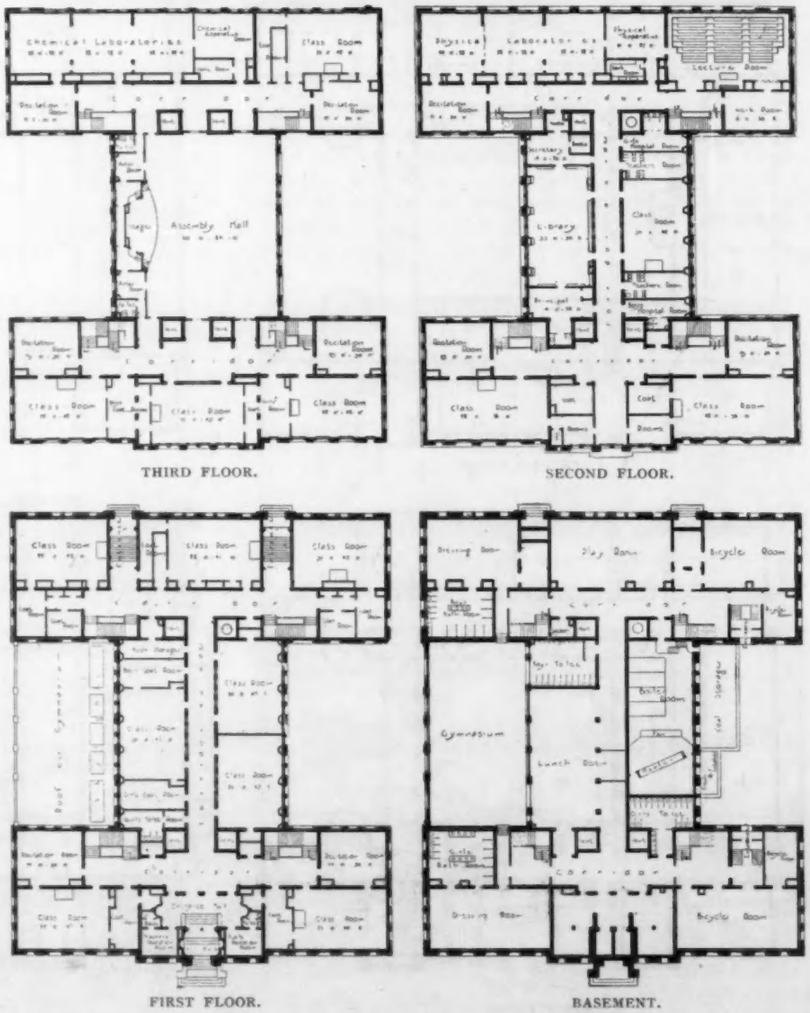
As originally designed, the building intended to accommodate the Springfield High School was larger, and at the same time more simple in plan, than the present building. It was to have accommodated one thousand pupils. The assembly hall was in the center upon the first floor, as in the building that was built, but the class rooms were grouped around this hall, forming four sides of a rectangle instead of three, as at present.

Upon a review of the whole, the commission in charge of the construction of the building decided to reduce the number to be accommodated to eight hundred, and to so arrange the building that the hall could be conveniently used for other than school purposes, and that the building should be given a somewhat more monumental and costly exterior than was first intended. The result was the building as now shown, whose faults as a monumental plan are clearly recognized by its designers. Its merits as a practical schoolhouse plan, with the special conditions imposed borne in mind, are evident to all conversant with such work.

The basement contains a large lunch room, and aquarium, bicycle rooms, toilet rooms, battery and storage rooms, and room for girls' gymnasium.

The boilers for heating are located outside the building.

Upon the principal floor is the assembly hall, occupying the center of the plan. This is approached from the principal entrance, and through the corridor opposite; also by a broad iron staircase, by means of which an audience may pass out upon the west side and down to the level of the grade surface between this and the old high-school building, which still remains standing a short distance away. To the right and

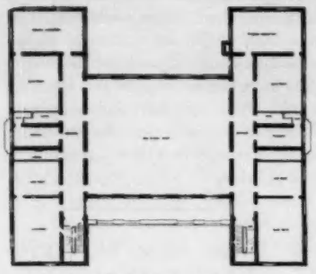


THIRD FLOOR. SECOND FLOOR.

FIRST FLOOR. BASEMENT.

PLANS, CAMBRIDGE LATIN SCHOOL.

left of the main entrance are the office and the private reception room of the principal, the office of the secretary, and a room for delivery of stationery and a limited number of books. Eight class rooms and four recitation rooms are also upon this floor.



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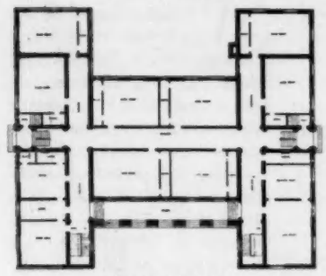


FIRST FLOOR.

HIGH SCHOOL IN A CITY IN THE STATE OF NEW YORK.

A broad covered passageway crossing by the west side of the hall, from which exit is made to the staircase previously mentioned, provides a thoroughfare between the front and rear portions of the building, which would otherwise have remained disconnected by the removal of this section of the original rectangle. Similar connection is made in the second story, but in this case the passage becomes a loggia, from which in passing one looks down into the hall below.

The plan of the second story is much like the first, except that immediately over the main entrance is the library. Drawing rooms, laboratories, and physical lecture room, with large storage rooms for apparatus occupy the third story, while a 12 ft. copper dome, projecting into an inner light well, is used as an astronomical observatory. This dome is so placed as to be invisible from the ground level, except at a very remote distance, and does not essentially affect the architectural expression of the building.

The assembly hall is also used for concerts, lectures, and other entertainments not directly connected with the work of the school.

The Latin School at Cambridge, Mass., is an interesting type of a high school, and demonstrates the fact that a plan in the form of a letter H gives a better opportunity for thoroughly lighting the wide American schoolrooms than is afforded by the courtyard type. In the letter H plan there can be eight instead of, as in the courtyard plan, four wide class rooms having light on two sides, an arrangement of windows which is essential for the proper lighting of a schoolroom 28 ft. wide; and further, the assembly hall may be made a much more cheerful and dignified room than is permitted by the courtyard plan when this hall is placed in the center of the courtyard.

This building shows coat rooms conveniently adjacent to the class rooms but less absolutely conforming to the "wardrobe" arrangement of graded schools, as was noted to be the case in some of the plans given above. It must certainly be an error of a draughtsman which shows on first-floor plan a class room which is accessible only through the cloak room, for such an arrangement would neutralize absolutely the advantage of a separate enclosure for storage of outside clothing. The width of 30 ft. is given certain of the class rooms lighted from one side only, while rooms on the corner, and hence lighted from two sides, are given a width of 28 ft.

This arrangement appears to be made to give the required dimensions for the exhibition hall, but the lighting of class rooms required that the excess of width should be given the corridor that runs between the class rooms.

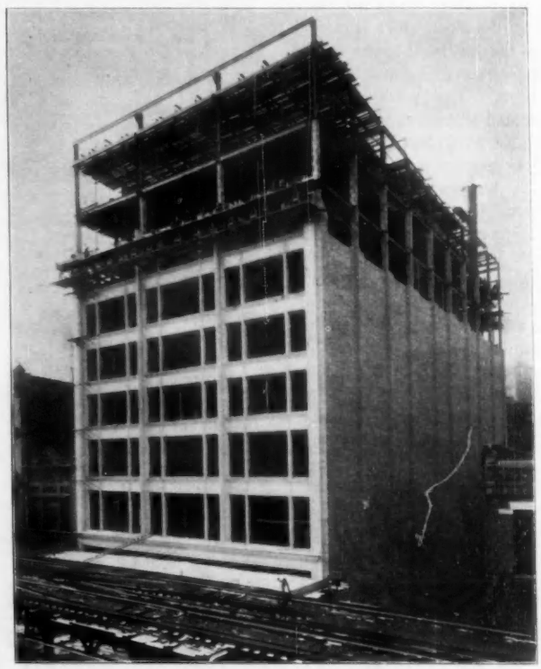
Fire-proofing.

RECENT IMPROVEMENTS IN FIRE-PROOF CONSTRUCTION AT CHICAGO.

THE AYER BUILDING.

BY PETER B. WIGHT.

THE Ayer Building illustrates what is now being done at Chicago in fire-proof construction and architecture in clay. Our half-tone illustration, through the kindness of the architects, Messrs. Holabird & Roche, shows how it looked in January, 1899. In the foreground is seen the superstructure of the Union Elevated Railroad with glimpses of the street below. The photograph was taken just after a snow flurry. The top of the sidewalk protection is seen between the railway structure and the building line, and is really about 8 ft. below the tracks. This obscures the first story,



AYER BUILDING, CHICAGO.
Holabird & Roche, Architects.

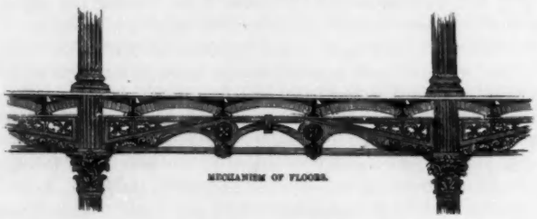
which is treated as a single opening, though two of the steel posts supporting the front are inside of the sash line. The building is 80 by about 150 ft. and nine stories high, being just within the 130 ft. limit of height, as now required by law. It is a good illustration of the result of the agitation against "sky-scrapers" in the home of their birth, and still it is high enough to make a good investment; and it might be added that it still provides a good field for steel skeleton construction. Situated on the best part of Wabash Avenue, which is second only to State Street as a high-priced retail thoroughfare, it is built so that it may be adapted to the varying demands of business for many years to come. It may be used for one retail business throughout its whole extent, or it may be divided into three retail shops on the first story and have a different business on each of the floors above, which may be subdivided indefinitely. It receives daylight only from the front and rear, and has no light shafts.

of a man's arm, is dovetailed at each end into the head of a column; the arch, of which it forms a part, can only be broken down by a weight at the top sufficient to pull this rod asunder. The iron which composes this arch is cast into shapes, which not only economize material by putting it just where wanted, but present an ornamental appearance.

"Across the top of these arches are placed a series of beams of rolled iron to support the floors. These beams, shaped much like the ⊥ rail of a railroad, lie four feet apart. The floors consist of a series of low brick arches turned from beam to beam. These are laid dry, grouted, and then filled up level with cement on the upper side, making a solid floor of brick and cement. Over this, for comfort, is laid a covering of wood, which is really only a carpet."

This was before the days of rolled I-beams. The structure still stands and has been in use for forty-four years; but if it were to be replaced by a modern building, it goes without saying that the whole construction would be fundamentally changed, and as we look at such things now in the light of experience of the past ten years, a building of this sort would not survive a fire more than three or four hours. One of the hardest fallacies to overcome with the early developers of fire-proof construction was the idea that iron of itself would resist heat, and the combination of wrought and cast iron which was used in this case for the girders is one which is peculiarly liable to give way under heat.

This instance also suggests a cycle of development. The Post. Office and the Sub-Treasury Building to which it invidiously refers



MECHANISM OF FLOORS.

were solid masonry constructions, guiltless of iron as a supporting factor. They can still fairly rank as fire-proof, and as architectural designs they are justly admired, even though not fully suited to modern commercial necessities. Iron, which in 1854 was just beginning to make its appearance, has passed through a whole gamut of development, until now we conceal it entirely and try to do without it, while in such structures as the Boston Public Library, which is probably as nearly absolutely fire-proof as any other type of construction, iron is as conspicuous by its absence as it is in the older New York buildings; which would seem to imply a return to a preference for masonry construction.

THE following sample of fire reporting is taken from the Associated Press dispatches of February 2, from Columbus, Ohio.

"A fire wall, 4 ft. thick, separated the fine block of Green, Joyce & Co., wholesale dry goods and notions, from the others, but this was no barrier, and at one o'clock this morning the fire had eaten its way through and was burning fiercely in the upper stories."

FULLY 90 per cent. of the fire-proof buildings constructed during the past twenty years have been built of porous terra-cotta, and whenever such material has been adequately used and properly set (and when we say adequately, we mean that every particle of metal should be protected thereby) it has indicated its thorough efficiency when called upon.

We advocate giving the manufacturer of hollow tile the privilege of setting his own material, grant him at the same time leeway to supply any petty deficiencies in the general fire-proofing which his experience teaches him is vital, and under these conditions you will secure a structure as thoroughly impervious to fire as the present appliances of science can furnish. — *Insurance Press.*

Mortar and Concrete and Mason's Department.

SOUNDNESS OF CEMENT.

BY IRA O. BAKER, MEMBER AMER. SOC. OF CIVIL ENGINEERS, PROFESSOR OF CIVIL ENGINEERING, UNIVERSITY OF ILLINOIS.

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SOUNDNESS refers to the ability of a cement to retain its strength and form unimpaired for an indefinite period. Soundness is a most important element, since if a cement ultimately loses its strength it is worthless, and if it finally expands it becomes a destructive agent. A cement may be unsound because of the presence in it of some active elements which cause the mortar to expand or contract in setting, or the unsoundness may be due to exterior agencies which act upon the ingredients of the cement. Most unsound cements fail by swelling and cracking under the action of expansives, but sometimes the mortar fails by a gradual softening of the mass without a material change of form. A sound cement is both constant in volume and permanent in strength.

The presence of small quantities of free lime in the cement is a frequent cause of unsoundness. The lime slakes, and causes the mortar to swell and crack, and perhaps finally disintegrate. The degree of heat employed in the burning, and the fineness, modify the effect of the free lime. Lime burned at a high heat slakes more slowly than when burned at a low temperature, and is therefore more likely to be injurious. Finely ground lime slakes more quickly than coarsely ground, and hence with fine cement the lime may slake before the cement has set, and therefore do no harm. The lime in finely ground cements will air-slake sooner than that in coarsely ground.

Free magnesia in cement acts very much like free lime. The action of the magnesia is much slower than that of lime, and hence its presence is a more serious defect, since it is less likely to be detected before the cement is used. The effect of magnesia in cement is not thoroughly understood, but seems to vary with the composition of the cement, the degree of burning, and the amount of water used in mixing. It was formerly held that 1½ or 2 per cent. of magnesia in Portland cement was dangerous, but it is now known that 5 per cent. is not injurious, while 8 per cent. may produce expansion. Since many of the natural cements are made of magnesium limestone, they contain much more magnesia than Portland cements, but chemists are not agreed as to the manner in which the different constituents are combined, and consequently are not agreed either as to the amount or effect of free magnesia in such a cement. Fortunately, it is not necessary to resort to a chemical analysis to determine the amount of lime or magnesia present, for a cement which successfully stands the ordinary test for soundness for seven, or at most twenty-eight, days may be used with confidence.

The effect of lime and magnesia seems to be more serious in water than in air, and greater in sea water than in fresh water.

TESTS OF SOUNDNESS.

Several methods of testing soundness have been recommended. Of those mentioned below, the first two are called cold tests, since the mortar is tested at ordinary temperatures, and the remainder accelerated or hot tests.

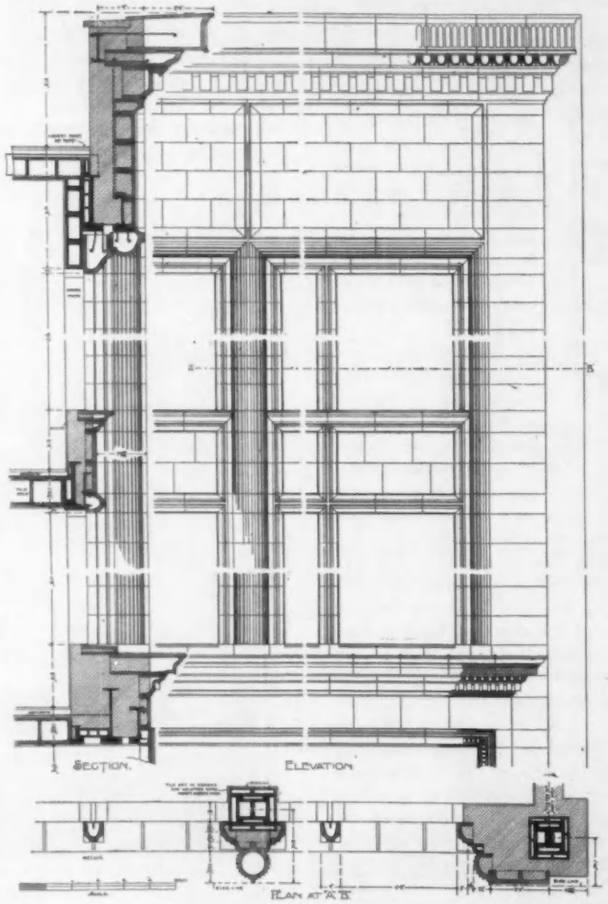
The Pat Test. The ordinary method of testing soundness is to make small cakes or pats of neat mortar 3 or 4 ins. in diameter with thin edges, upon a sheet of glass, and examine from day to day for twenty-eight days (if possible), to see if they show any cracks or

Steel skeleton construction is used throughout, supported on a foundation partly of piles and partly of caissons filled with concrete. The latter were used to satisfy the objections of the owners and occupants of the small building on the south. The wall on the north side, where the adjoining property is vacant, is a party wall built by agreement, consisting of Z-bar steel posts covered with hollow porous terra-cotta tile and connected by a 12 in. brick wall, which is continued around the posts on both sides, outside of the porous tile, and 4 ins. in thickness. This 12 in. wall on each story encloses a horizontal I-beam, which carries its weight, story by story. From this it will be seen that, used as a fire wall, it occupies only 6 ins. of each lot, and it could only be knocked down one panel at a time.

The construction of the front wall is best shown in the detail drawing, which gives in section the second floor, any one of the intermediate floors, and the roof. The two intermediate steel posts set back from the front, which is carried on the 24 in. I-beam at the second story floor and brackets above. The posts are fire-proofed all around with hollow porous terra-cotta blocks, after their recesses have been filled with the same. All horizontal beams in the front are also fire-proofed with porous terra-cotta independent of all other covering. The exposed front and mullions are entirely built of nearly white terra-cotta, the method of setting and fastening being shown in the detail. The half-tone print testifies to the perfection and uniformity of this material, which the workmen are seen to be setting. The floors are all of I-beams and flat end-pressure hollow porous terra-cotta arches, with soffit plates under the beams. All girders (which are transverse) and interior posts are covered with porous terra-cotta independent of the floor arches.

In the eighth floor the arches are seen completed and the centers are struck. In the ninth floor the arches in the picture are built and the centers are still in place. The centering planks are in place ready for the roof arches. The photograph was taken so as to show the method and order of the construction. The detail drawing shows how the work will be completed. The steel chimney in the rear is lined with fire brick and enclosed in a square wall of hollow tile. This is the method now in general use for the largest Chicago buildings.

The Ayer Building is on the site formerly occupied by a new seven-story building of mill construction, which was burned about a year ago, when many lives were sacrificed in the burning, which occupied about thirty minutes. It will have every element of protection against fire known to science, except covering for the front windows. This building is an open confession that where the fenestration calls for the greatest possible amount of daylight, the risk of fire from such an exposure must be accepted, and this will be so as long as tenants refuse to use rolling steel shutters even if they are provided. In this case, however, the street has a clear width of 100 ft. and the risk is greatly lessened thereby. In design the front is an illustration of what Holabird & Roche have so often done before,—showing that when windows much wider than their height set horizontal *masses* in opposition to vertical *lines*, the application of such a treatment to the high building problem gives more satisfaction to the eye than any other that has been attempted. The simplicity and refinement of detail in this street front is another illustration of the tendencies of architectural design at Chicago, especially where terra-cotta is used.



DETAIL OF FRONT OF AYER BUILDING.

FIRE-PROOFING FIFTY YEARS AGO.

WHILE engaged in our periodical hunt through a mass of second-hand books in one of our stores, we came across a copy of *Harper's Magazine* for December, 1865, containing a description of the printing and publishing establishment occupied by Harper & Brothers in Franklin Square, erected in 1854. The construction of this building, which was then supposed to be fire-proof, was so interesting, judged from our modern standpoints, and some features of the description thereof were so naively innocent of what we now call the principles of fire resistance, that the account would be of interest to any one who has followed the development of modern constructions. We quote:—

"Hitherto no fire-proof building had been built which contained more than a single story wholly available for any practical use. The floor of this main story was upheld by a series of arches and columns, filling almost all the space, and darkening what was not filled. There was no known means of making the flooring of the main story strong enough to support stories above without sacrificing a great portion of the space. For examples of fire-proof buildings before the iron age, one needs but to look at the building at the corner of Wall and Nassau Streets, once used for the Custom House and now used as the Sub-Treasury, and the old Merchants' Exchange, now the Custom House, on Wall Street. The architect of the former building gave up a third of the space to utterly useless porticoes, and in the latter case, besides giving up much space to the great portico, constructed the walls and windows in such a manner that nearly half of the rooms must be artificially lighted during a great part of the day.

"The whole interior structure of both buildings is supported upon a series of iron columns, rising from story to story. From column to column in each story extends a girder composed of a cast-iron arch and a *wrought*-iron tension-rod. This rod, about the size

Brick and Terra-Cotta Work in American and Foreign Cities, and Manufacturers' Department.

NEW YORK. — Having just completed the first year of our existence as "Greater New York," it is a fitting time to pause and consider whether we are in a better condition now that we are banded together under one charter. To begin with we have an increase of $330,000,000 in the assessed valuation of real estate in Manhattan and Bronx. Provision has been made for the issue of $35,000,000 of bonds, the margin for this increase of funded debt being created by the enormous advance in the assessed valuation, which in the whole city on real and personal property will be at least $500,000,000.

TERRA-COTTA DETAIL FOR RESIDENCE AT BALTIMORE.
Executed by the Conkling-Armstrong Terra-Cotta Company.
Wyatt & Nolting, Architects.

What is to be done with the $35,000,000 and more to be received for the new bonds? Is the vital pressing need of the people for adequate underground transit to be met? Not at all. A third of this vast sum is set aside for parks and several millions for bridges, which, of course, are necessary and will be a great benefit to the city, but the crying need of the metropolis now is swift and comfortable transit.

As the conditions are at present, it is much more comfortable and convenient to live in one of our many beautiful suburbs, even in the neighboring State of New Jersey, than in the city of New York. As the *Herald* puts it, "What a spectacle we present, with a set of rulers who are at once raising the salaries of office holders, piling new taxation on the people, heaping up funded indebtedness, and deliberately standing in the way of the improvement most vitally needed for the comfort of the citizens who foot the bills!"

DETAIL, FRONT ENTRANCE, RESIDENCE AT BALTIMORE, MD.
Wyatt & Nolting, Architects.
Elevation and plan shown in plate form.

Property owners and real-estate dealers alike insist that the increased valuations will seriously affect the real-estate market. They will hurt property because the property while taxed very heavily cannot produce any more rent than is produced now, because, in their judgment, the rental limit in the Borough of Manhattan has been reached.

To give an idea of the enormous increase in the assessed valuations we cite here a few of the more important of our public buildings, showing their assessed valuation this year and last: —

	1898.	1899.
Bowling Green Building . .	$1,500,000	$2,500,000
Equitable Life Building . .	4,150,000	6,000,000
Mutual Life Building . . .	2,200,000	3,500,000
New York Life Building . .	2,000,000	3,000,000
Waldorf-Astoria Hotel . . .	3,550,000	5,500,000
Grand Central Station . . .	2,500,000	3,500,000

Our only hope now is that there will be a rearrangement of taxation on a more equitable basis. Many properties are taxed too high in comparison with the rest of the city; many more are taxed too low. This is unquestionably the chief reason why there has been so little dealing in large properties in the heart of the city while at the same time there has been considerable of a boom in property in the outlying districts. The auction sales of lots have been particularly successful, in one case a large parcel of property having been closed off in two hours and for much higher prices than was anticipated. This, of course, is encouraging and will mean a season of activity among architects and builders whose work is in the line of dwellings and buildings of medium cost.

FAIENCE MANTEL FOR RESIDENCE AT ALBANY, N. Y.
Executed by the Atwood Faience Company.
Franklin H. Janes, Architect.

signs of distortion. The test is usually made with neat cement mortar. The amount of water used in mixing (see page 165, THE BRICKBUILDER), within reasonable limits, seems to have no material effect on the result. The first evidence of bad quality is the loosening of the pat from the glass, which generally takes place, if at all, within one or two days. Good cement will remain firmly attached to the glass for two weeks at least. The cracks due to expansion occur usually at the edges of the pat, and radiate from the center. These cracks should not be confused with irregular hair-like shrinkage cracks, which appear over the entire surface when the pats are made too wet and dry out too much while setting.

The German standard specifications require the cake to be 1.5 centimeters (0.5 in.) thick at the center, to be kept twenty-four hours in a closed box or under a damp cloth, and then stored in water. The French, to make sure that the pats do not get dry before immersion, recommend that the cakes be immersed immediately after mixing, without waiting for the mortar to set. Some really sound natural cements will disintegrate if immersed before setting has begun.

Expansion Test. Various experiments test the soundness of cement by measuring the expansion of a bar of cement mortar. The French Commission recommend either the measurement of the expansion of a bar 32 ins. long by ½ in. square, or the measurement of the increase of circumference of a cylinder. The German standard tests require the measurement of the increase in length of a prism 4 ins. long by 2 ins. square. The apparatus for making these tests can be had in the market, and it is not wise to occupy space here with a description thereof. The tests require very delicate manipulation to secure reliable results.

Accelerated Tests. The ordinary tests, extending over a reasonable period, sometimes fail to detect unsoundness; and many efforts have been made to utilize heat to accelerate the action, with a view of determining from the effect of heat during a short time what would be the action in a longer period under normal conditions. Some of these tests have been fairly successful, but none have been extensively employed. It is difficult to interpret the tests, as the results vary with the per cent. of lime, magnesia, sulphates, etc., present, and with their proportions relative to each other and to the whole. There is a great diversity as to the value of accelerated tests.

Many natural cements which go all to pieces in the accelerated tests, particularly the boiling test, still stand well in actual service. This is a strong argument against drawing adverse conclusions from accelerated tests when applied to Portland cement.

The *warm-water test*, proposed by Mr. Faija,[1] a British authority, is made with a covered vessel partly full of water maintained at a temperature of 100. to 115 degs. Fahr., in the upper part of which the pat is placed until set. When the pat is set, it is placed in the water for twenty-four hours. If the cement remains firmly attached to the glass and shows no cracks, it is probably sound.

The *hot-water test*, proposed by Mr. Maclay,[2] an American authority, is substantially like Faija's test above, except that Maclay recommends 195 to 200 degs. Fahr.

The *boiling test*, suggested by Professor Tetmajer, the Swiss authority, consists in placing the mortar in cold water immediately after mixing, then gradually raising the temperature to boiling after about an hour, and boiling for three hours. The test specimen consists of a small ball of such a consistency that when flattened to half its diameter it neither cracks nor runs at the edges.

The *kiln test* consists of exposing a small cake of cement mortar, after it has set, to a temperature of 110 to 120 degs. C. (166 to 248 degs. Fahr.) in a drying oven until all the water is driven off. If no edge cracks appear, the cement is considered of constant volume.

The *flame test* is made by placing a ball of the cement paste, about 2 ins. in diameter, on a wire gauze and applying the flame of a Bunsen burner gradually, until at the end of an hour the temperature is about 90 degs. C. (194 degs. Fahr.). The heat is then increased until the lower part of the ball becomes red hot. The appearance of cracks probably indicates the presence of an expansive element.

The *chloride-of lime test* is to mix the paste for the cakes with a solution of 40 grams of calcium chloride per liter of water, allow to set, immerse in the same solution for twenty-four hours, and then examine for checking and softening. The chloride of lime accelerates the hydration of the free lime. The chloride in the solution used in mixing causes the slaking before setting of only so much of the free lime as is not objectionable in the cement. The chloride of calcium has no effect upon free magnesia.

As before stated, there is a great diversity of opinion as to the value of accelerated tests for soundness; for example, one really competent expert will defend some particular accelerated test and condemn all others, while another equally competent authority will commend some other hot test and condemn all others. Probably each is correct for the limited field of his investigation. Owing to this state of affairs, it is not wise to discuss the subject further here. Fortunately, the pat test, as described above, when carefully conducted, is sufficient for most practical purposes.

[1] Trans. American Society of Civil Engineers, Vol. XVII., p. 223; also Vol. XXX., p. 57.

[2] Trans. American Society of Civil Engineers, Vol. XXVII., p. 412.

THE PRODUCTION OF PORTLAND CEMENT IN THE UNITED STATES IN 1897–98.

AN excerpt has been issued by the United States Geological Survey from the annual report of the director for 1897–98, Part V., Mineral Resources of the United States, giving the data for the production and consumption of hydraulic cement in this country in 1897, which contains some interesting figures in regard to the production of American Portland cement. In 1895 less than 1,000,000 barrels were made; in 1896 over 1,500,000 barrels was the output; while in 1897 this had risen to 2,677,775 barrels, an increase of 1,134,752 barrels over 1896, or nearly 74 per cent. The domestic production in 1896 was only 34.7 per cent. of our entire consumption, whereas in 1897 it had increased to 56.8 per cent. The increase in the production was, as in former years, largely in the Lehigh Valley region, where the product nearly doubled and amounted to 74.8 per cent. of the entire output of the country. New York produced 14.7 per cent., Ohio, 5.5 per cent., and all other sections, 5 per cent. These figures show that the increase in production outside of the Lehigh Valley has been very slow and has not kept pace with the consumption of Portland cement in those regions, this industry being still an insignificant one there. The Lehigh Valley is, therefore, the center of the Portland cement industry of the country and the increase in its production in seven years has been tenfold.

The imports of Portland cement decreased in 1897 nearly 900,000 barrels, from 2,989,597 to 2,090,924 barrels. The imports from Germany were 53 per cent. of the whole and decreased much less than those from other countries. The imports from Great Britain were less than one half of those made in 1896. English Portland cement has fallen into disrepute and is seldom met with except on the Pacific coast. Next to Germany, Belgium makes the largest exports of cement to us, but these have fallen off from 742,237 barrels in 1896 to 529,686 barrels in 1897. Other foreign countries made insignificant exports.

It is stated that during 1897 the increase in the domestic production of Portland cement has, for the first time, greatly exceeded the increase in consumption in this country, more than one half of our consumption being of American manufacture. This is due largely to the very high grade materials produced by American manufacturers, much of it having been found to show decidedly higher tests than the imported article. American Portland cements have also been superior in fineness of grinding, and Professor Newberry states that it is gratifying to find that an industry, so new to this country and one requiring so high a degree of technical knowledge, has already developed to a point beyond that which it has reached in Germany.

Among the most interesting projects now under consideration is a scheme to bring Cathedral Heights within easier access from down town by a viaduct connecting the crest of the hill with the

HOTEL TOURAINE, BOSTON, MASS.
Fire-proofed by the Boston Fire-proofing Company; front brick furnished by the Sayre & Fisher Company.
Winslow & Wetherell, Architects.

116th Street Station of the elevated railroad. This has already interested many property holders on the plateau and promises to take form in an application to the borough board of improvements in a few days.

It is an interesting sight to observe the clever way in which the burned and ruined front of the Home Life Building is being removed and replaced without disturbing the occupants.

We are glad to be able to report that our new Hall of Records is to be begun at once. Judging from the plans of the architect, Mr. J. R. Thomas, it will be a fine building and a credit to the city. We can only hope now that the old structure in use at present will not burn down before the completion of the new one, which will probably be about May 1, 1900.

The competition for the new building of the New York Yacht Club has been decided in favor of Messrs. Warren & Wetmore, a a firm of young architects hitherto unknown, whose design is in every way French.

Among the few items of important new work are: —

A new club house for the Union Republican Club is contemplated. It will cost $200,000 and will be erected on 164th Street, corner Third Avenue.

Hugo Smith, architect, has planned a $175,000 office and theater building to be erected on Broadway and Flushing Avenue, Brooklyn.

C. P. H. Gilbert, architect, has filed plans for a twelve-story fireproof office and storage warehouse to be erected on 125th Street near Park Avenue. It will be built of marble and light gray brick, and will cost $300,000.

It is reported that the People's Tabernacle is to erect a new building on 102d Street near Madison Avenue, to cost about $40,000.

CHICAGO. — A damage suit was recently tried in the Circuit Court here, which serves to call attention to a very bad and flimsy feature common to all local flat building construction. A tenant, who fell to the ground from the rear porch of a lower flat in this city, through the giving way of a defective or broken railing, brought suit against the parties who owned the building and was awarded damages in the sum of $800. The evidence showed that the porch and railing were all of wood, and put together in the most flimsy and slipshod manner, like hundreds of others in connection with buildings of the same class, the horizontal rails being merely butted against, and "toe-nailed" into, the end supports. Not long ago an elderly woman fell from the second floor of a similar porch through the giving way of the railing and was killed.

PANEL FOR AN APARTMENT HOUSE, NEW YORK CITY.
Executed in terra-cotta by the New Jersey Terra-Cotta Company.
Kurtzer & Rohl, Architects.

So much for the dangerously flimsy nature of these eyesores, — these cheap makeshifts. As for their ugliness and poverty-stricken cheerlessness, they are too familiar to us all, especially the patrons of elevated roads, to require further comment. They are simply an aggravated instance of the short-sightedness of the speculative builder and the ruthless investor, who strive (sometimes with the connivance of an "artchitect") to make an imposing "front" on the street, forgetful that sides and rear in their cheap nakedness are nearly as much exposed to the public, and quite as much lived with by the tenants. They are like the ostrich which buries its head in the sand and thinks to be hid.

Now it would not be so very difficult for a skilful architect to design buildings of this class which would be agreeable to the eye from all points, with porches or loggias and stairs in the rear, convenient and pleasant to the occupants, and so durable that the saving in repairs and paint, added to their attractiveness to tenants, would bring ample return on first cost to the investor, even with the cheapest class of flat buildings. Brick, terra-cotta, and iron are the materials which should be employed, and the "rear porch" should compare favorably in permanence and careful treatment with the Italian loggia or cortile.

EXECUTED IN TERRA-COTTA BY THE NORTHWESTERN TERRA-COTTA COMPANY.

Fire has just destroyed the old building at the northwest corner of Madison Street and Wabash Avenue, which has been occupied for many years by the McClurg bookstore. Many priceless volumes and manuscripts were de-

stroyed. A modern fire-proof building will doubtless soon be erected on this, one of the best corners in the fashionable retail district.

It seems a certainty that Marshall Field will erect a bank and office building on the northeast corner of Clark and Adams Streets, and that D. H. Burnham & Co. will be the architects. The proposed cost, as stated, is in the neighborhood of $2,000,000. Present prospects, therefore, indicate that there will be a renewal of Chicago's normal activity in important down-town improvements during the approaching season.

Altogether, even the pessimists are becoming convinced that capitalists and investors have begun to weary of the wild speculative activity which has directly followed the return of prosperity, and are now ready to turn their attention to real estate and building as in days before the panic.

ST. LOUIS. — There is a feeling of expectancy in building circles, and some hopeful indications of improvement with the advancement of the season, which is doubtless stimulated by the prevailing low rate of interest and the amount of money seeking investment.

The chief center of interest lately has been Washington Avenue, where a number of large commercial buildings have been erected or are contemplated, among the most recent of which is a ten-story building on 10th Street. It is to be of fire-proof construction, and the contract was awarded, a few days ago, for $175,000, by the architect, Mr. Isaac Taylor.

SEAL OVER ENTRANCE NEW YORK BOTANICAL MUSEUM, BRONX PARK.
Executed by the New York Architectural Terra-Cotta Company.
R. W. Gibson, Architect.

No small interest centered in the recent competition for the decoration of the two assembly rooms in the new City Hall. Mr. W. W. Davis was the successful competitor, out of nine, the price being $10,000.

A movement to commemorate in 1903 the centennial anniversary of the Louisiana Purchase has been successfully launched, and an endeavor is to be made to eclipse all previous efforts at holding exhibitions. Should the scheme succeed, there will be much of interest to the architects and builders in due course of time, as there will doubtless be some unique problems to solve.

The local chapter of the American Institute of Architects is trying to induce the legislature to pass a bill licensing architects. The bill seems to have the hearty support of the Master Builders. The purpose of the bill, of course, is the "elevation of the profession," by requiring a standard of proficiency and preventing incompetent builders and draughtsmen from preparing plans for buildings. There is evidence of the necessity of some such protection for the sake of human life if nothing more. Only recently a building collapsed during construction, owing to overloaded column and girders, causing loss of life.

The mayor has promised to commence the new City Hospital this spring. The old building was destroyed some years ago by the cyclone, and since that time the city has been occupying old buildings illy suited to such purposes, and the necessity has arisen for some immediate action to relieve the situation.

HOUSES, MELBURY ROAD, KENSINGTON, ENGLAND.
Wallace & Stevenson, Architects.

ILLUSTRATED ADVERTISEMENTS.

EXCELSIOR TERRA-COTTA COMPANY, page iv, details of main entrance St. Raymond's Roman Catholic Church, West Chester, N. Y.; George H. Streeton, architect. The elevation is shown elsewhere in this number.

Conkling-Armstrong Terra-Cotta Company, page v, stock designs in terra-cotta, some of which were employed in houses illustrated in Plates 11 and 14.

Fiske, Homes & Co., page x, detail of molded brickwork, Plymouth Building, Minneapolis, Minn.; Frederick Kees, architect.

Ludowici Roofing Tile Company, page xxvi, Frances E. Willard School, Chicago, Ill.; Norman S. Patton, architect.

MANUFACTURERS' CATALOGUES AND SAMPLES DESIRED.

THE following-named architects would be pleased to receive manufacturers' catalogues and samples: Rockwell M. Milligan, Chemical Building, St. Louis, Mo.; Frank Elwood Brown, 61 Orange Street, New Haven, Conn.; Edgar B. Fox, 85 North High Street, Columbus, Ohio; James S. A. Mercer, 1300 Broadway, New York City.

CURRENT ITEMS OF INTEREST.

THE CLEVELAND WIRE SPRING COMPANY has recently closed contracts for over a million of their wall ties, for use in New York, Philadelphia, and Chicago.

THE MOORE & WYMAN ELEVATOR AND MACHINE WORKS reports business as improving, they having received contracts for a number of passenger and freight elevators during the past month.

THE architectural terra-cotta used in the new Hoxie Building, Fort Worth, Texas, and the new high-school building at Lincoln, Ill., will be supplied by the St. Louis Terra-Cotta Company.

THE DAGUS CLAY MANUFACTURING COMPANY reports business as being good with them. They have recently made

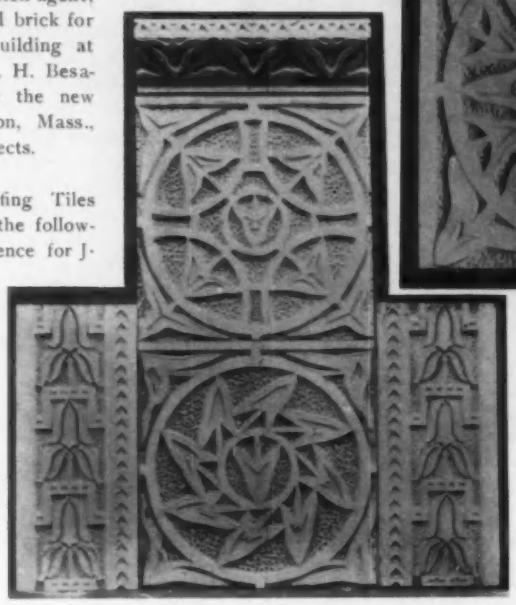
large shipments of brick to Philadelphia, New York City, and Pittsburgh.

THE architectural terra-cotta for the new Sullivan Building at St. Louis, Isaac S. Taylor, architect; also for the fine new residence for Corwin H. Spencer, Esq., St. Louis, Barnett, Haynes & Barnett, architects, will be supplied by the Winkle Terra-Cotta Company.

THE AMERICAN ENAMELED BRICK AND TILE COMPANY will furnish, through their Boston agent, J. W. Hahn, the enameled brick for a new primary school building at South Boston, Mass., W. H. Besarick, architect; also for the new Hecht Building, Boston, Mass., Weisbein & Jones, architects.

THE Celadon Roofing Tiles have been specified on the following new buildings: residence for J. D. Sawyer, Esq., Stamford, Conn., Mrs. E. E. Holman, architect; residence for Nathaniel Witherill, Esq., Greenwich, Conn., N. C. Mellen, architect; residence for E. B. Harvey, Esq., Buffalo, N. Y., M. C. Miller, architect.

THE POWHATAN CLAY MANUFACTURING COMPANY reports the following new contracts: Cream-white brick for the new residence of W. H. Parrish, Esq., at Richmond, Va., Muhlenberg Bros., architects; silver-gray bricks for the Petersburg Savings and Insurance Company's new building at Petersburg, Va., Peebles & Sharpe, architects; front bricks for a new office building at Newport News, Va., H. W. Silsby, architect.



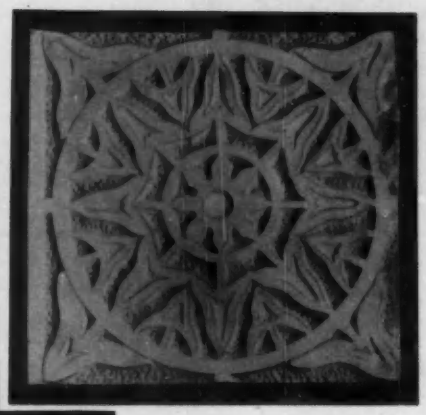
DETAIL FOR THE NEW LAW BUILDING, INDIANAPLIS, IND.
Executed in terra-cotta by the Indianapolis Terra-Cotta Company.
Louis H. Gibson, Architect.
Mr. Gibson chose for his motive, the arrow-shaped lily which grows in great abundance in the ponds of Indiana.

THE WHITE BRICK AND TERRA-COTTA COMPANY has closed new contracts as follows: Residence, New Rochelle, N. Y., for John G. Agar, Clinton & Russell, architects; residence, 105th Street and Riverside Drive, C. H. P. Gilbert, architect; apartments, 108th Street and Central Park, West, Angell & Higginson, architects; apartments, 103d Street and Boulevard, D. W. King, architect; laboratory, Northampton, Mass., Herts & Tallant, architects.

AT the recent convention of the National Brick Manufacturers' Association, held at Columbus, Ohio, Chambers Bros. Company placed on exhibition a full-size automatic side-cutter, of their new design, which attracted a great deal of attention, and is a novelty in this class of mechanism. They also exhibited a working model of their automatic end-cut brickmaking machine, running the machine with the aid of an electric motor.

SHELTER HOUSE, PROSPECT PARK, BROOKLYN, N. Y.
Guastavino enameled tile ceiling.
McKim, Mead & White, Architects.

THE AMERICAN ENAMELED BRICK AND TILE COMPANY is now prepared to fill orders in enameled brick made up on the old German standard size, the enameled bricks being 3 by 6 by 3. These bricks can be used most advantageously for kitchen hearth work, or for lining kitchens themselves. They have adopted this line because of having been requested by several architects to offer a brick of these dimensions.



H. H. MEIER & CO.'s Puzzolan Cement is being supplied for brickwork at the following buildings by Waldo Brothers, agents: Hotel, Beacon Street, Boston, W. T. Sears, architect; Adams House, Boston, W. Whitney Lewis, architect; Back Bay Station, Boston, Shepley, Rutan & Coolidge, architects; Proctor Building, Boston, Winslow & Wetherell, architects; school, Groton, Mass., Peabody & Stearns, architects; house, Thompson, Conn., Shepley, Rutan & Coolidge, architects.

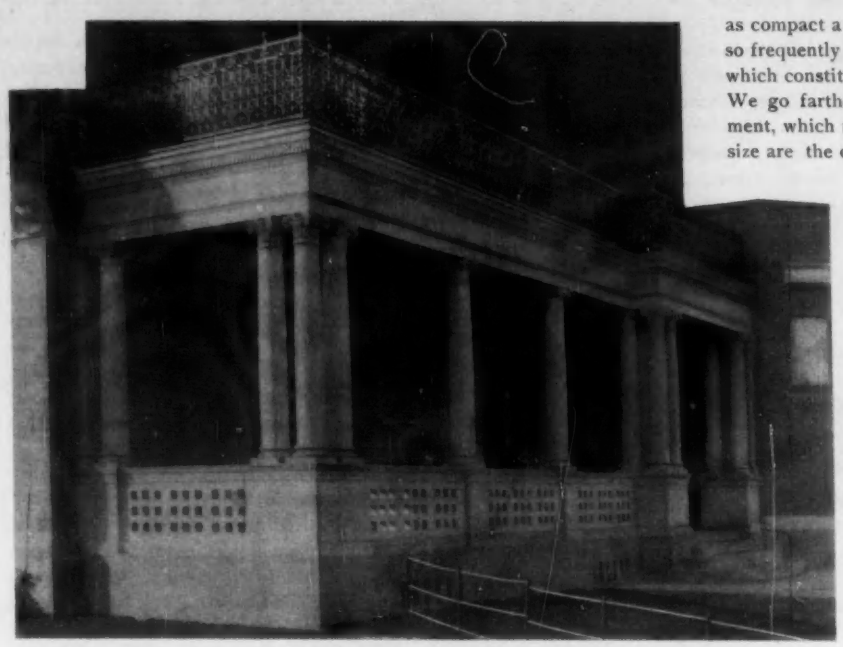
THE fine new Union Station at Kansas City, Mo., designed by Van Brunt & Howe, has all stairs fully equipped with Mason Safety Tread. The new buildings of the Jefferson Medical College in Philadelphia, James Windrim, architect, and the new Hochelaga and Montmorency mills at Montreal, T. Pringle & Sons, engineers, are also provided with these treads, furnished by the American Mason Safety Tread Company, of Boston.

THE COLUMBUS FACE BRICK COMPANY, of Columbus, Ohio, presents its card to the readers of THE BRICKBUILDER in the advertising columns of this issue. This company is incorporated under the laws of Ohio, with a paid-up capital of $100,000, and is making a specialty of mottled brick in gold, bronze, and ivory shades. The plant is a perfect one from the most exacting brickmaker's standpoint and has at this time a capacity for making 7,500,000 per annum.

The property of the company contains within its own borders a wide variety of clays and several great veins of coal, so situated that both are transported by gravity from mine to machine.

The mottled brick is made from a natural composition which they have named the "Ironclay," and the effects produced are said to be quite unsurpassed for beauty of finish and perfect coloring.

Mr. J. P. Hazelton, the vice-president, a competent and experi-



PORCH, RESIDENCE, JAMAICA PLAIN, MASS.
Wheelwright & Haven, Architects.

enced brickmaker, is in charge of the plant, and Mr. David C. Meehan is the secretary and general manager.

The company is now engaged in providing a large stock for ready distribution, and will be prepared to meet all demands in ample time for the coming building season. Agencies are being established in the principal cities and correspondence is invited.

BRICKS FOR SEA WALLS.

IT is well known that many stones employed by the engineer for marine works decay rapidly from the action of boring mollusca. Plymouth and Portland breakwaters, amongst numerous other works, have frequently been cited in this connection. The reason stone is preferred to any other substance commonly employed for constructional purposes is because it is found in such large blocks, which give the sea more work to do in breaking them up than if the stones were simply of the size of bricks. At Portland the method is to feed the marine molluscs with odd blocks of Portland stone, which are tipped over the breakwater to the seaward side, and which thus afford protection to the main structure. Such stone is composed almost entirely of carbonate of lime, and the boring mollusca find no difficulty in dealing with it. It would be otherwise, however, if bricks were employed; and the enormous expense attending the feeding alluded to would be considerably minimized. We are not aware that *Saxicava*, *Lithodomus*, or *Pholas* has ever been able to get through a really good, substantial, heavy, and compact vitrified brick. In marine walls and the like these can be very readily laid in thin courses of hydraulic cement, and form quite as compact a wall as do many of the odd blocks and rubble so frequently thrown together with a plentiful cement between, which constitutes the average modern sea wall and esplanade. We go farther, and state that the use of superabundant cement, which must be employed when odd blocks of variable size are the chief substances in the wall, is a direct invitation to these deleterious molluscs. For though they may not be able, conveniently, to bore into the rubble stone, they can deal with the cement, unless this latter contains much carbonate of magnesia. In short, although bricks are already used to a large extent for sea walls, in our opinion they should still further supersede stone for that purpose. Where the hydraulic cement is of first-rate quality, the bricks are bound together quite as firmly into large blocks as when Nature does the work. Indeed, a good cement is, as a rule, much more durable in the atmosphere also than the cement binding together grains of sand to form sandstone, and oolitic spherules as in the formation of an oolite. Good, sound, heavy, vitrified bricks only could, of course, be permitted. — *British Brickbuilder*.

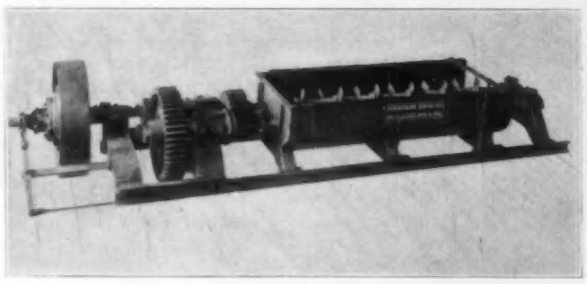
MEMPHIS, TENN. — Thanks to the strictest of quarantines and additional sanitary precautions, yellow fever has been kept out of Memphis during 1898, and the many projected improvements that were started in 1897, but postponed by the scare in the fall of that year, will be realities in 1899. A new City Hall and Union Depot are to be erected at an early date, which with the new Telephone Exchange will mean the expenditure of nearly

ST. RAYMOND'S ROMAN CATHOLIC CHURCH, WEST CHESTER, N. Y.
Terra-cotta work executed by the Excelsior Terra-Cotta Company.
George H. Streeton, Architect.

a million dollars for buildings public and private during the coming year.

Mississippi has finally laid hands on sufficient funds for her much-needed new capitol building to be erected at Jackson. Texas has enjoyed a phenomenal year of abundant crops and the outlook for building has never been brighter. The same can be said of Georgia, Arkansas, Alabama, and Louisiana, where colleges, schools, churches, and residences are beginning to spring up on every hand, and a most decided improvement is noticeable in the architectural handling of buildings of every class all over the South. Especially is this true in the employment of brick, terra-cotta, and stone where wood was formerly used.

THIS mill is shown with open top, but is so designed that the top may be covered, say one half or two thirds of the distance back



THE CHAMBERS NO. 6 DOUBLE SHAFT HORIZONTAL MIXING AND PUGGING MACHINE.

from the discharge end. It is a double-geared machine, with all bearings outside the tub and away from the material to be worked. It has two 5 in. diameter shafts, carrying forty-eight steel knives — twenty-four in each shaft — so secured that they can be set at any desired angle. The driving shaft is 2⅞ ins. diameter and is fitted with friction clutch pulley, 36 ins. diameter by 8½ ins. face, with starting lever located at a convenient position for the attendant. The whole machine is on a framework of steel channels, and all the driving gear is journaled in one solid casting. Width of frame, 3 ft.; length, exclusive of driving pulley, 13 ft. 6 ins. From bottom of frame to top of tub, 2 ft. Weight, unboxed, about 5,500 lbs.

W. P. GRATH, secretary and treasurer of the Illinois Supply and Construction Company, St. Louis, has invented a gas-producing, consuming, and coking furnace, which can be applied to brick kilns, boilers, annealing furnaces, etc. A public test of this furnace was recently held at the plant of the American Hydraulic Pressed Brick Company, for the benefit of a delegation of St. Louis brickmakers. The results were extremely gratifying and even more successful than Mr. Grath had claimed they would be.

In this furnace nothing but the cheapest grade of slack coal is used, from which the gases are first extracted and consumed, leaving a mass of red-hot coke, which is then shoved over on the grates and burned. The incandescent heat from this coke ignites and burns the gases from the fresh supply of slack, which is then put on the gas or coking tables. Sixteen of these furnaces were used to a kiln. After the fires in these furnaces were once thoroughly ignited, no black smoke whatever came out of the stack, showing that the gases generated were consumed and the combustion perfect.

These furnaces are now for sale in connection with the Grath Patent Down Draft Brick Kiln (invented 1895).

The American Hydraulic Pressed Brick Company have six of these Grath Patent Kilns at their plant at Collinsville, Ill., and state that they have given the best of results in burning pressed brick. In burning red pressed brick these kilns burn a clear No. 10 shade on top, and a No. 3 and No. 4 shade on the floor; the burning is also uniform from side to side, and front to back. The results are even more remarkable in burning colored bricks: buff, gray, etc. From a kiln of gray brick just burned, 99 per cent. were sent directly to the building for first-quality face brick.

One concern, the Hunter Brick Works, Thurber, Texas, who have eight of these kilns, say that provided the brick are properly made in the first place, every one of them comes out of the kiln good enough to deliver as first-class front brick.

Parties interested in burning brick should write to the Illinois Supply and Construction Company, St. Louis, Mo., for information regarding this kiln and coking furnace.

Artistic Mantels.

Showing modest but very effective results at small cost.

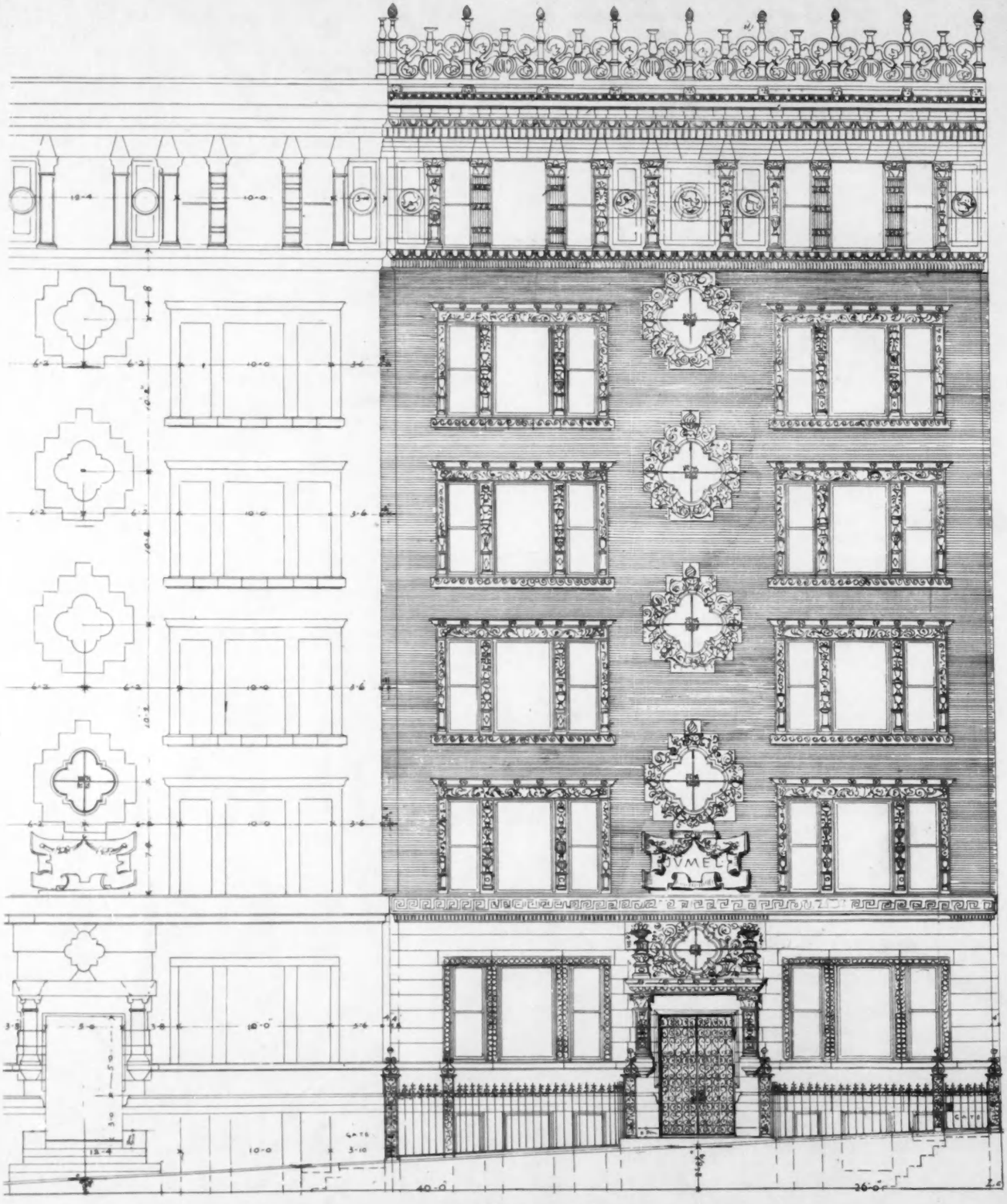
Price $25.

Price $26.

Price $22.

Prices given are for the Face and Molded Red Brick necessary to set up the mantels as shown (including lining, underfire, and tile hearth), carefully packed in barrels and delivered to cars or steamer at Boston. Scale setting plan furnished free. Our mantels are the newest, most stylish, and best of all kinds in every way. Our customers say so. Our Sketch Book tells all about 59 designs of charming mantels costing from $12 upwards. Send for it.

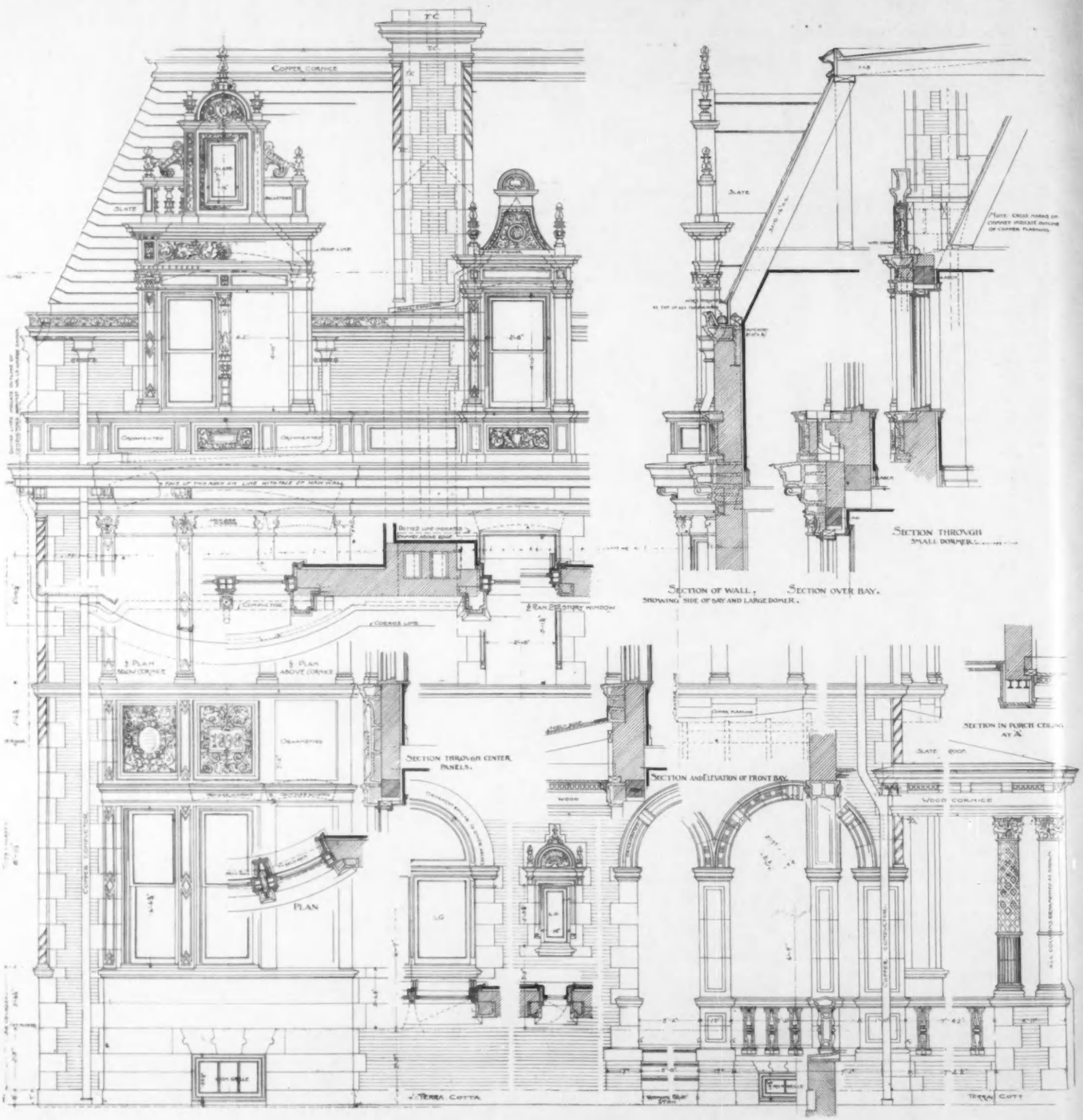
Phila. & Boston Face Brick Co. - 215 Liberty Square, Boston, Mass.



FRONT ELEVATION.

APARTMENT HOUSES, WEST 142D STREET, NEW YORK CITY.

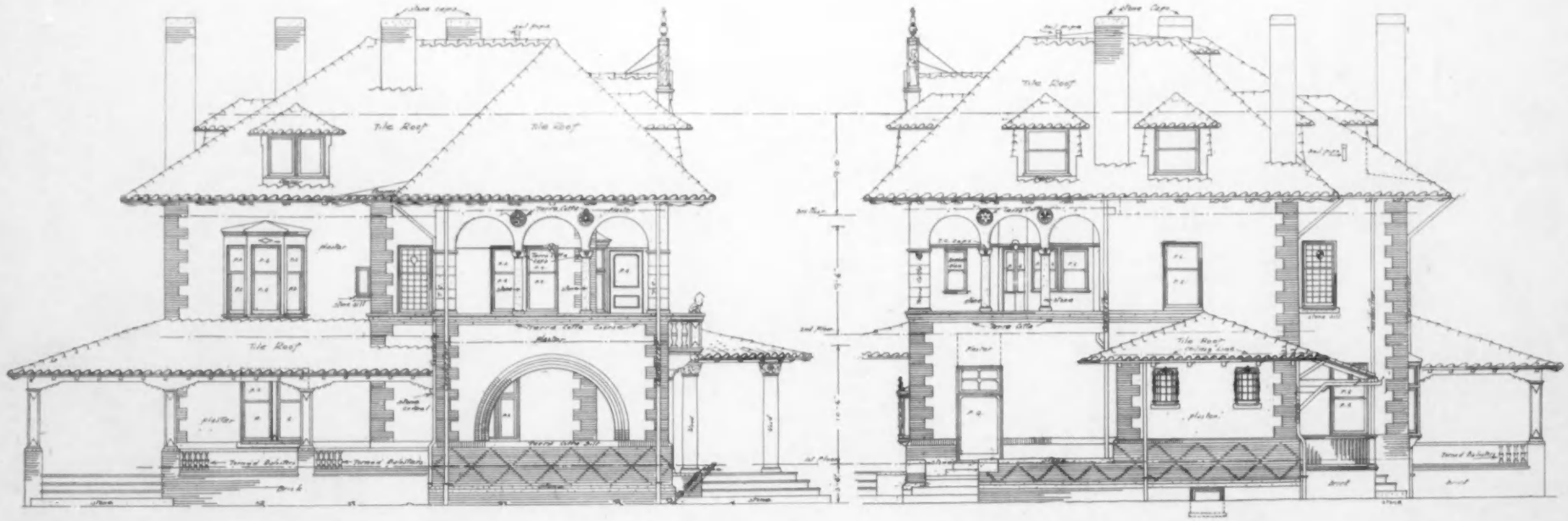
J. A. SCHWEINFURTH, ARCHITECT.



TERRA-COTTA AND WINDOW DETAILS.

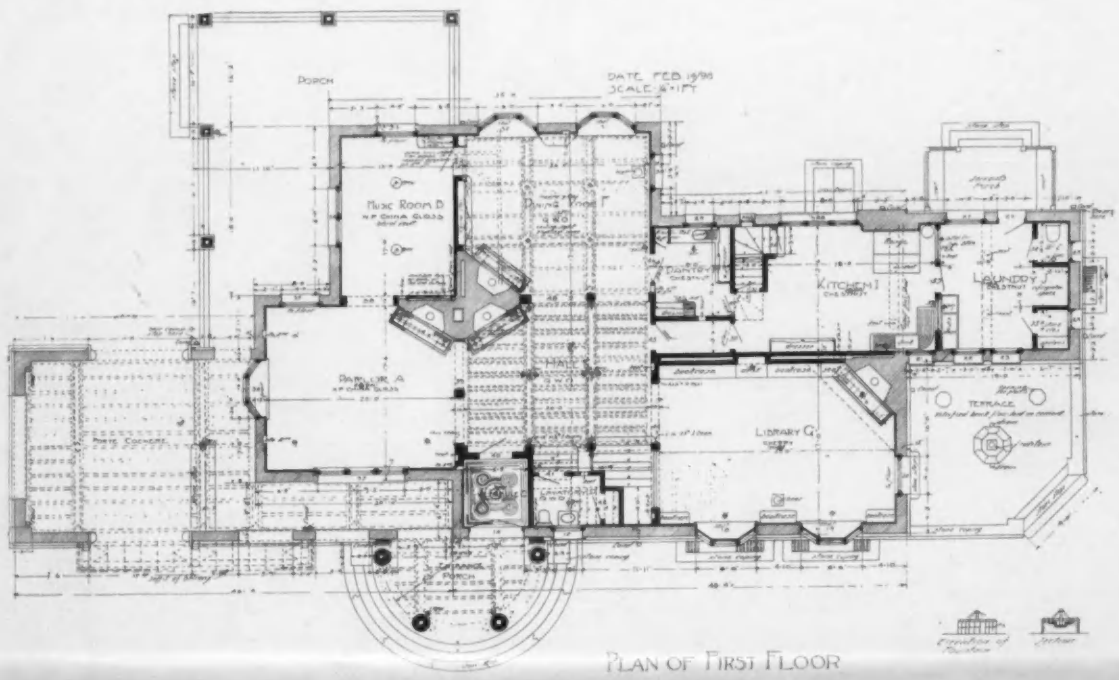
A PAIR OF SEMI-DETACHED HOUSES, TIOGA STREET, PHILADELPHIA, PA.

EDGAR V. SEELER, ARCHITECT.



·SIDE · ELEVATION·

·SIDE·ELEVATION



PLAN OF FIRST FLOOR

THE BRICKBUILDER
VOL. 8. NO. 2.

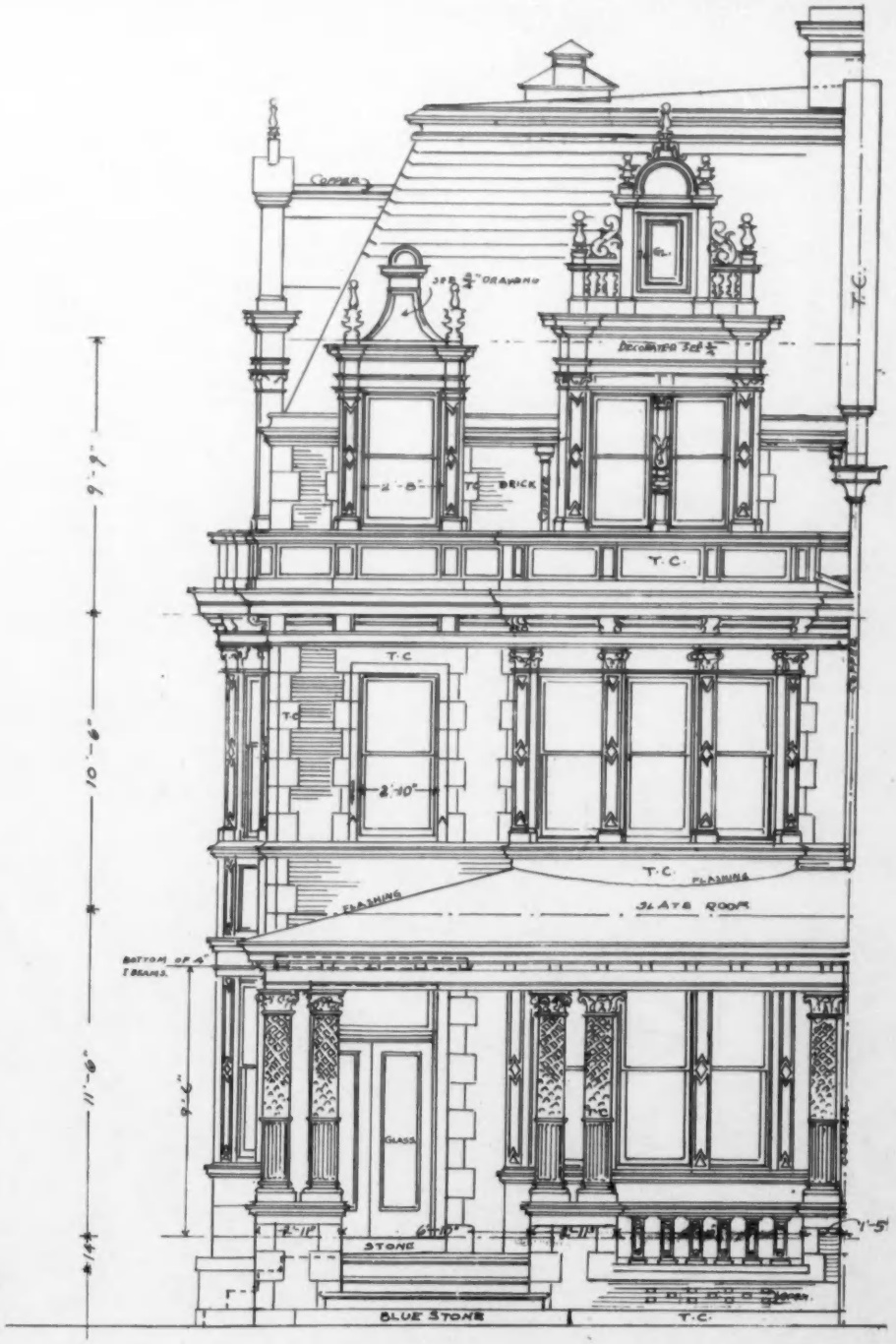
·REAR·ELEVATION·

·FRONT·ELEVATION·

RESIDENCE, OGONTZ PARK, OGONTZ, PA.

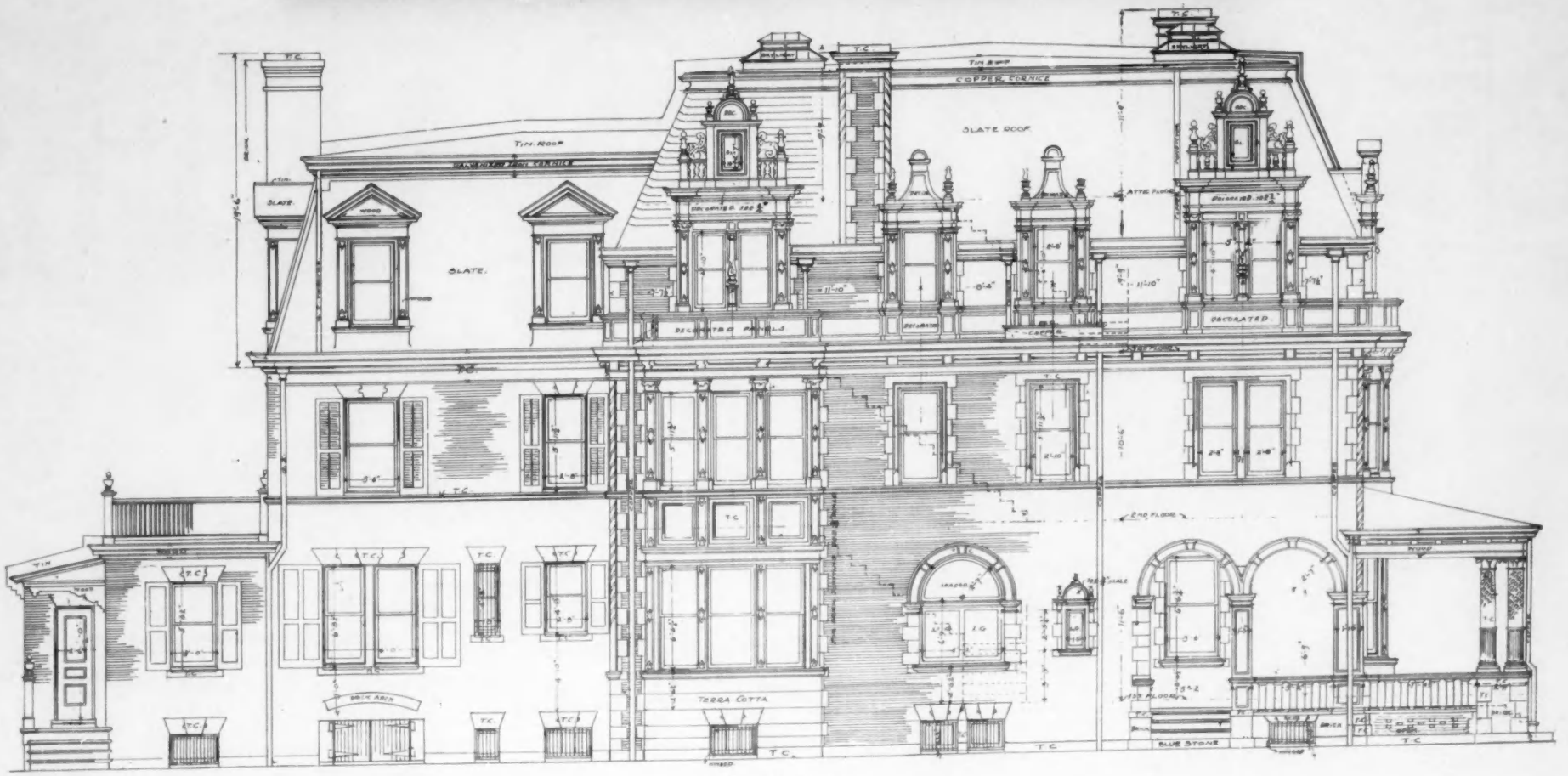
KEEN & MEAD, ARCHITECTS.

REAR ELEVATION



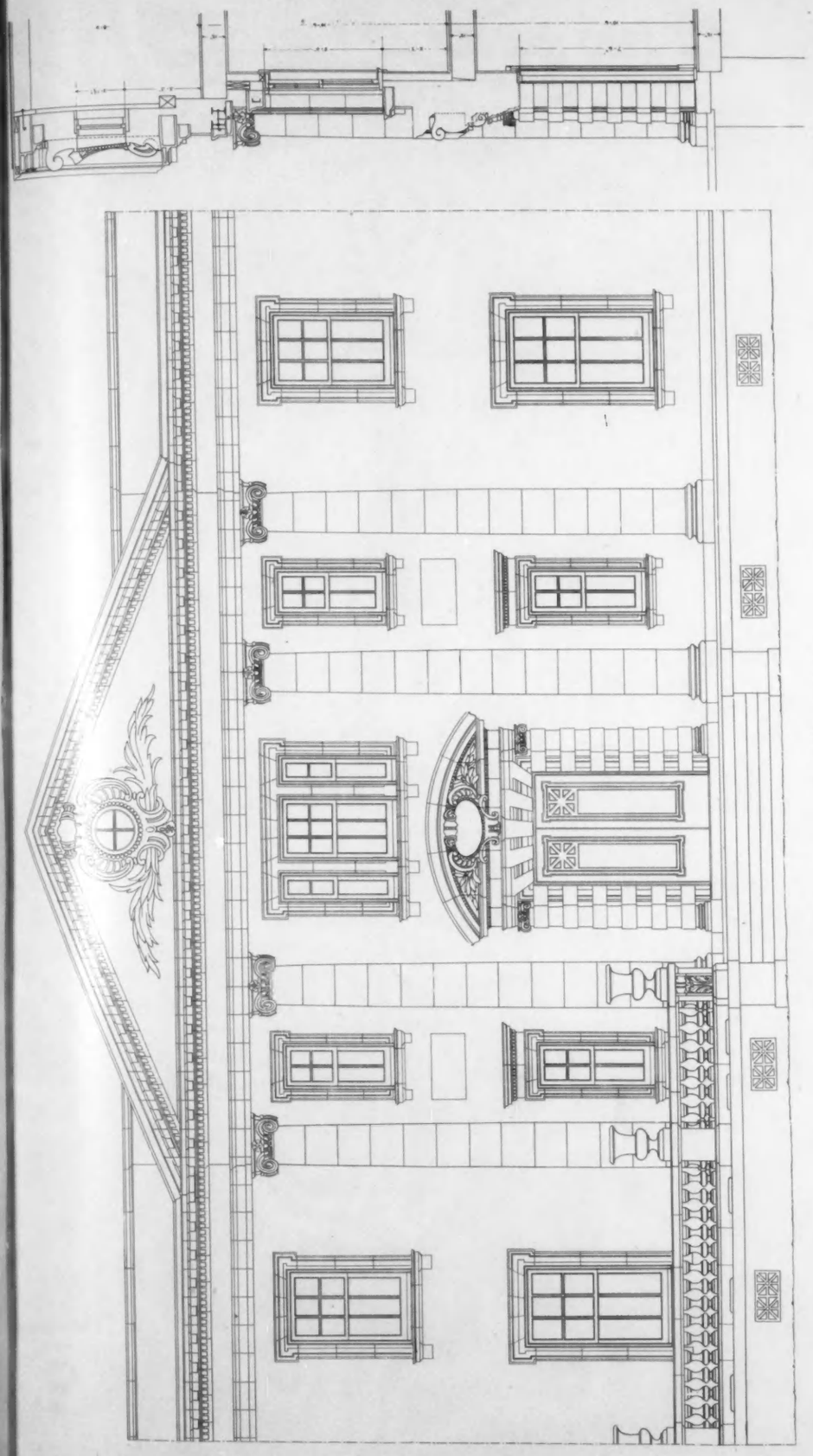
FRONT ELEVATION

THE BRICKBUILDER
VOL. 8. NO. 2.



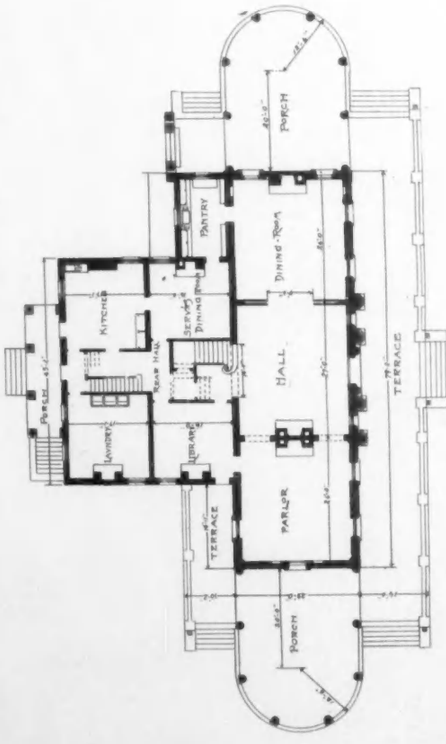
SIDE ELEVATION.

A PAIR OF SEMI-DETACHED HOUSES, TIOGA STREET, PHILADELPHIA, PA. EDGAR V. SEELER, ARCHITECT.

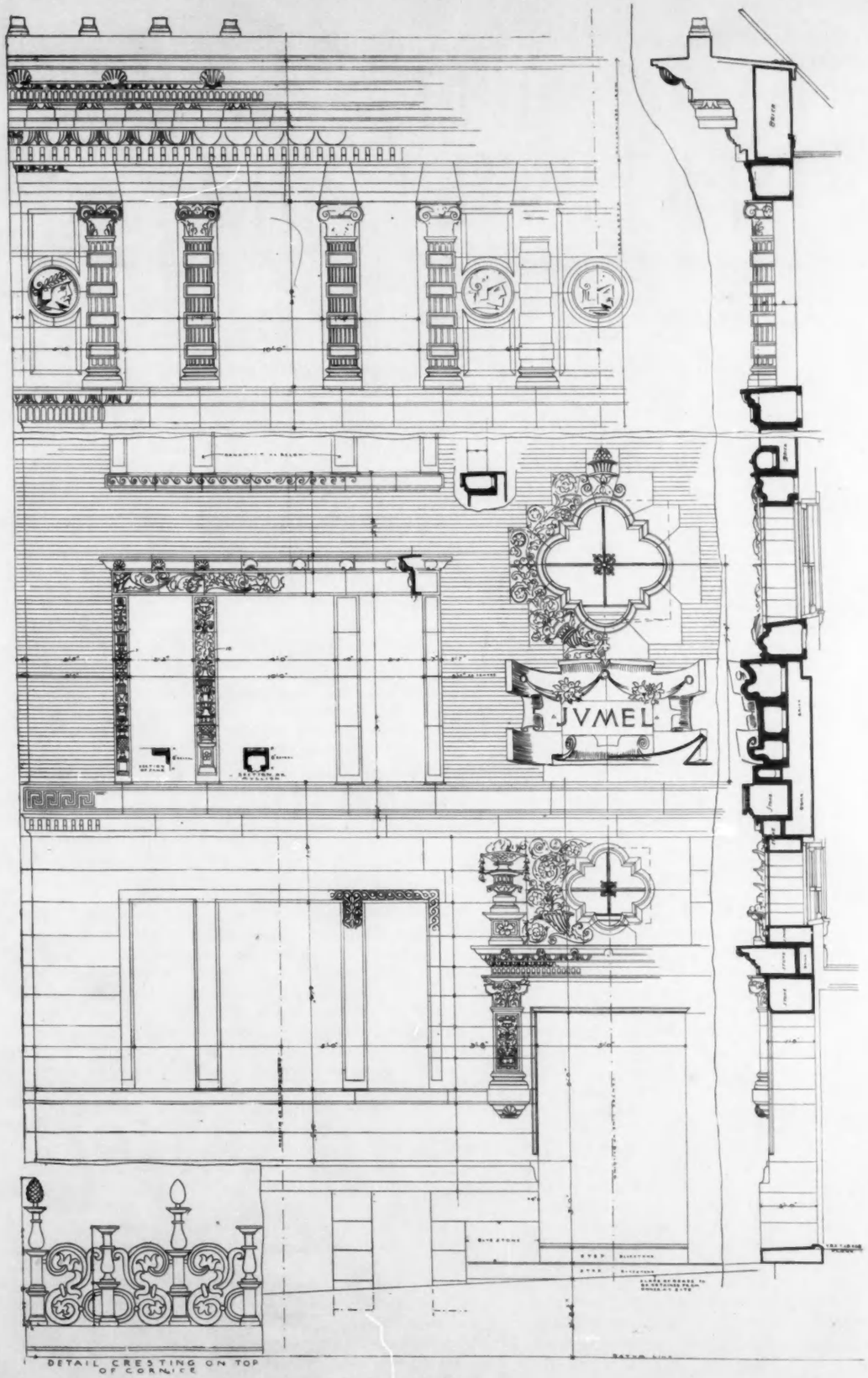


PORTION OF FRONT ELEVATION

RESIDENCE AT BELAIR, HARFORD COUNTY, MARYLAND.
WYATT & NOLTING, ARCHITECTS.



FLOOR PLAN



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